

SAMSUNG

COLOR TELEVISION RECEIVER

Chassis : S15A
Model: CK331EV5S/NWT

SERVICE *Manual*

COLOR TELEVISION RECEIVER



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7. Electric Parts List

7-1 CK331EVR5S/NWT Parts List

Loc. No.	Code No.	Description ; Specification	Remark	Loc. No.	Code No.	Description ; Specification	Remark
ASSY-PCB,MAIN(OPT)				C416	2306-000350	C-FILM,MPPF;270nF,5%,400V,TP,26X18.5X10MM,20	
BUYER : SMSC				C417	2201-000556	C-CERAMIC,DISC;470pF,10%,500V,Y5P,TP,7x4,5	
				C418	2401-000384	C-AL;10uF,20%,100V,GP,TP,6.3x11,5mm	
				C419	2201-000984	C-CERAMIC,DISC;680pF,10%,2KV,Y5P,TP,11x6,7,5mm	
				C502	2301-000213	C-FILM,PEF;220nF,5%,250V,TP,21.5x11,7,5	
				C503	2201-002063	C-CERAMIC,DISC;10nF,+80-20%,3KV,Y5V,TP,16x5,7	
				C504	2401-001232	C-AL;4.7uF,20%,250V,GP,TP,10x12,5,5	
				C506	2401-000430	C-AL;10uF,20%,250V,GP,TP,10x16mm,5mm	
				C601	2202-000210	C-CERAMIC,MLC-AXIAL;270pF,10%,50V,Y5P,TP,1.9x3.5,7	
				C602	2401-000030	C-AL;22uF,20%,25V,GP,TP,5x11,5	
				C603	2301-000445	C-FILM,PEF;4.7nF,5%,50V,TP,5.5x7x3mm,5mm	
				C604	2401-001323	C-AL;470nF,20%,50V,BP,TP,5x11,5mm	
				C610	2401-001998	C-AL;1000uF,20%,25V,GP,TP,10x20,5mm	
				C611	2301-000445	C-FILM,PEF;4.7nF,5%,50V,TP,5.5x7x3mm,5mm	
				C612	2401-001323	C-AL;470nF,20%,50V,BP,TP,5x11,5mm	
				C613	2202-000796	C-CERAMIC,MLC-AXIAL;1nF,10%,50V,Y5P,TP,3.5X1.9MM,-	
				C614	2202-000210	C-CERAMIC,MLC-AXIAL;270pF,10%,50V,Y5P,TP,1.9x3.5,7	
				C702	2202-000263	C-CERAMIC,MLC-AXIAL;470pF,10%,50V,Y5P,TP,3.5x19,-	
				C704	2202-000121	C-CERAMIC,MLC-AXIAL;100pF,10%,50V,Y5P,TP,1.9x3.5,-	
				C705	2401-001989	C-AL;4.7uF,20%,50V,BP,TP,5x11,5	
				C706	2401-001989	C-AL;4.7uF,20%,50V,BP,TP,5x11,5	
				C800	2306-000320	C-FILM,MPPF;470nF,20%,250V,TP,-,20mm	
				C801	2401-002213	C-AL;150uF,+30-10%,450V,GP,BK,25x35	
				C802	2401-001192	C-AL;33uF,20%,50V,GP,TP,6.3x11,5	
				C803	2301-000224	C-FILM,PEF;22nF,5%,50V,TP,7.4x3.9x13mm,5mm	
				C804	2301-000310	C-FILM,PEF;68nF,5%,50V,TP,8.0X8.5X4.0X5,5	
				C805	2303-000163	C-FILM,PPF;2.2nF,5%,800V,TP,15x13x8,5,7,5	
				C806	2201-000446	C-CERAMIC,DISC;3.3nF,20%,400V,Y5U,TP,18x8,10mm	
				C807	2201-000991	C-CERAMIC,DISC;560pF,10%,2KV,Y5P,TP,13x7,7,5	
				C808	2401-000262	C-AL;100uF,20%,160V,HR,TP,16x25,7,5	
				C809	2401-002290	C-AL;47uF,20%,160V,GP,TP,13x20,5	
				C810	2201-000991	C-CERAMIC,DISC;560pF,10%,2KV,Y5P,TP,13x7,7,5	
				C811	2401-003141	C-AL;2200uF,20%,25V,WT,TP,13x25,5mm	
				C814	2301-000192	C-FILM,PEF;1nF,5%,50V,TP,5.3x10mm,5mm	
				C815	2401-002594	C-AL;220uF,20%,16V,GP,TP,8x11,5,5	
				C816	2401-000603	C-AL;1uF,20%,50V,GP,TP,5x11,5	
				C818	2401-002144	C-AL;47uF,20%,16V,GP,TP,5x11,5	
				C819	2401-001840	C-AL;100uF,20%,16V,GP,TP,6.3x11,5	
				C901	2401-001840	C-AL;100uF,20%,16V,GP,TP,6.3x11,5	
				C902	2202-000796	C-CERAMIC,MLC-AXIAL;1nF,10%,50V,Y5P,TP,3.5X1.9MM,-	
				C904	2202-000796	C-CERAMIC,MLC-AXIAL;1nF,10%,50V,Y5P,TP,3.5X1.9MM,-	
				C905	2401-001333	C-AL;470nF,20%,50V,GP,TP,5x11,5	
				C907	2201-000119	C-CERAMIC,DISC;100nF,+80-20%,50V,Y5V,TP,8x3,5	
				C908	2201-000193	C-CERAMIC,DISC;10pF,0.3pF,50V,CH,TP,5x3,5	
				C909	2201-000193	C-CERAMIC,DISC;10pF,0.3pF,50V,CH,TP,5x3,5	
				C910	2306-000122	C-FILM,MPPF;100nF,5%,50V,TP,7.3x4.0x5.0mm,	
				C911	2401-002235	C-AL;10uF,20%,16V,GP,TP,5x11mm,5mm	
				C912	2201-000234	C-CERAMIC,DISC;150pF,5%,50V,CH,TP,9.5x3,5	
				C913	2301-000108	C-FILM,PEF;1.5nF,5%,50V,TP,6.5x3.0x5.5mm,	
				C914	2306-000122	C-FILM,MPPF;100nF,5%,50V,TP,7.3x4.0x5.0mm,	
				C915	2306-000122	C-FILM,MPPF;100nF,5%,50V,TP,7.3x4.0x5.0mm,	
				C916	2301-000192	C-FILM,PEF;1nF,5%,50V,TP,5.3x10mm,5mm	
				C917	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
				C919	2202-000796	C-CERAMIC,MLC-AXIAL;1nF,10%,50V,Y5P,TP,3.5X1.9MM,-	
				C920	2401-000480	C-AL;10uF,20%,50V,GP,TP,5x11,5	
				C922	2201-000573	C-CERAMIC,DISC;47pF,5%,50V,CH,TP,6.5x3,0,5	
				C923	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
				C924	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
				C926	2202-000796	C-CERAMIC,MLC-AXIAL;1nF,10%,50V,Y5P,TP,3.5X1.9MM,-	
				C927	2201-000573	C-CERAMIC,DISC;47pF,5%,50V,CH,TP,6.5x3,0,5	
				CA01	2401-001989	C-AL;4.7uF,20%,50V,BP,TP,5x11,5	
				CN501	AA39-20109A	LEAD-CONNECTOR,ASSY,-,YBNH025-08,S,8P,400,1007#26	
				CN602	3711-002643	CONNECTOR-HEADER;BOX,4P,1R,2.5mm,STRAIGHT,SN	
				CN701	3711-000628	CONNECTOR-HEADER,-,11P,1R,2.5mm,STRAIGHT,-	
				CN802	AA27-20003U	COIL-DEGAUSSING,-,14,16.4ohm,75T,890mm,D	

Electric Parts List

Loc. No.	Code No.	Description ; Specification	Remark	Loc. No.	Code No.	Description ; Specification	Remark
CW901	2503-000156	C-NETWORK;100pFx4,20%,50V		JS701	3722-000183	JACK-SCART;21P,4mm,SN,BLK,NO	
D201	0401-000005	DIODE-SWITCHING;1N4148,75V,200MA,DO-35,TP		L102	2701-000212	INDUCTOR-AXIAL;68uH,10%,2.8x7mm	
D202	0401-000005	DIODE-SWITCHING;1N4148,75V,200MA,DO-35,TP		L103	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
D205	0401-000005	DIODE-SWITCHING;1N4148,75V,200MA,DO-35,TP		L202	2701-000168	INDUCTOR-AXIAL;3.3uH,5%,2.5x3.4mm	
D208	2001-000633	R-CARBON;30KOHM,5%,1/8W,AA,TP,-		L206	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
D209	0401-000005	DIODE-SWITCHING;1N4148,75V,200MA,DO-35,TP		L301	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
D210	0401-000005	DIODE-SWITCHING;1N4148,75V,200MA,DO-35,TP		L302	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
D211	0401-000005	DIODE-SWITCHING;1N4148,75V,200MA,DO-35,TP		L304	2701-000159	INDUCTOR-AXIAL;22uH,10%,4.2x9.8mm	
D213	0401-000005	DIODE-SWITCHING;1N4148,75V,200MA,DO-35,TP		L305	2701-000116	INDUCTOR-AXIAL;10uH,10%,4.2x9.8mm	
D401	0402-000132	DIODE-RECTIFIER;1N4004,400V,1A,DO-41,TP		L306	2701-000115	INDUCTOR-AXIAL;10uH,10%,2.8x7mm	
D402	0402-000132	DIODE-RECTIFIER;1N4004,400V,1A,DO-41,TP		L401	AA27-30003R	COIL-LINERITY;-;220uH,YL10x10,0.35mm,23x13mm	
D403	0402-001105	DIODE-RECTIFIER;ERB43-04SV1,400V,1.0A,-,TP		L402	2901-000297	FILTER-EMI ON BOARD;-;3A,-,-,3.5x5,TP,-	
D404	0402-000534	DIODE-RECTIFIER;RG10V,400V,1.2A,DO-201,TP		L601	2701-000146	INDUCTOR-AXIAL;2.2uH,10%,2.5x3.4mm	
D405	0402-001105	DIODE-RECTIFIER;ERB43-04SV1,400V,1.0A,-,TP		L702	2701-000184	INDUCTOR-AXIAL;4.7uH,10%,2.5x3.4mm	
D406	0402-001105	DIODE-RECTIFIER;ERB43-04SV1,400V,1.0A,-,TP		L703	2701-000184	INDUCTOR-AXIAL;4.7uH,10%,2.5x3.4mm	
D501	0402-000216	DIODE-RECTIFIER;ERC24-06,600V,1.0A,DO-204		L704	2701-000184	INDUCTOR-AXIAL;4.7uH,10%,2.5x3.4mm	
D502	0402-001105	DIODE-RECTIFIER;ERB43-04SV1,400V,1.0A,-,TP		L706	2701-000184	INDUCTOR-AXIAL;4.7uH,10%,2.5x3.4mm	
D503	0402-001105	DIODE-RECTIFIER;ERB43-04SV1,400V,1.0A,-,TP		L801	AA29-30001B	FILTER-LINE;-;27mH,-,-,-	
D504	0402-001105	DIODE-RECTIFIER;ERB43-04SV1,400V,1.0A,-,TP		L804	3301-000287	CORE-FERRITE BEAD;AA,3.5x1.0x6.0mm,1500,2400G	
D701	0401-000005	DIODE-SWITCHING;1N4148,75V,200MA,DO-35,TP		L805	2901-000297	FILTER-EMI ON BOARD;-;3A,-,-,3.5x5,TP,-	
D800	1405-000187	VARISTOR;750V,1250A,12.5x7mm,TP		L807	2901-000297	FILTER-EMI ON BOARD;-;3A,-,-,3.5x5,TP,-	
D801	0402-000102	DIODE-BRIDGE;D2SB60,600V,1.5A,-		L809	2701-001032	INDUCTOR-AXIAL;100uH,10%,5x14mm	
D802	0402-000540	DIODE-RECTIFIER;RU20A,600V,1.5A,-,TP		L810	2701-001032	INDUCTOR-AXIAL;100uH,10%,5x14mm	
D803	0402-000430	DIODE-RECTIFIER;FML-G02S,200V,3.0A,TO-220F,BK		L902	2701-000189	INDUCTOR-AXIAL;470nH,10%,2.5x3.4mm	
D804	0402-000213	DIODE-RECTIFIER;ERB12-06,600V,1.0A,DO-41,TP		L904	2701-000299	INDUCTOR-AXIAL;13uH,10%,2.5x3.4mm	
D809	0401-000005	DIODE-SWITCHING;1N4148,75V,200MA,DO-35,TP		LD901	AA96-30007A	ASSY-LED,GUIDE;-;AA61-50055A,DL-GTGA,GREEN	
D810	0402-000216	DIODE-RECTIFIER;ERC24-06,600V,1.0A,DO-204		NT801	1404-001075	THERMISTOR-NTC;5ohm,15%,-.17mW/C,TP	
D901	0401-000005	DIODE-SWITCHING;1N4148,75V,200MA,DO-35,TP		P801	1404-001048	THERMISTOR-PTC;70hm,30%,200/220V,270V,19A,-,B	
D903	0401-000005	DIODE-SWITCHING;1N4148,75V,200MA,DO-35,TP		PC801	0604-001038	PHOTO-COUPLER;TR,130-260%,200mW,DIP-4,ST	
D905	0401-000005	DIODE-SWITCHING;1N4148,75V,200MA,DO-35,TP		Q201	0501-002183	TR-SMALL SIGNAL;KTC9014,NPN,625mW,TO-92,TP,100	
D906	0401-000005	DIODE-SWITCHING;1N4148,75V,200MA,DO-35,TP		Q202	0501-002183	TR-SMALL SIGNAL;KTC9014,NPN,625mW,TO-92,TP,100	
D907	0401-000005	DIODE-SWITCHING;1N4148,75V,200MA,DO-35,TP		Q204	0501-002183	TR-SMALL SIGNAL;KTC9014,NPN,625mW,TO-92,TP,100	
D908	0401-000005	DIODE-SWITCHING;1N4148,75V,200MA,DO-35,TP		Q401	0502-001115	TR-POWER;KSC5386,NPN,50W,TO-3PF,ST,8-	
D910	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-		Q402	0501-000369	TR-SMALL SIGNAL;KSC2331-Y,NPN,1W,TO-92L,-,120-	
DA01	0401-000005	DIODE-SWITCHING;1N4148,75V,200MA,DO-35,TP		Q701	0501-002183	TR-SMALL SIGNAL;KTC9014,NPN,625mW,TO-92,TP,100	
DZ201	0403-000355	DIODE-ZENER;UZ5.1BSB,5.1V,4.97-5.18V,500mW		Q703	0501-000283	TR-SMALL SIGNAL;KSA539,PNP,400mW,TO-92,TP,120-	
DZ202	0403-000551	DIODE-ZENER;MTZ3.9B,3.9V,3.89-4.16V,500mW		Q901	0501-002183	TR-SMALL SIGNAL;KTC9014,NPN,625mW,TO-92,TP,100	
DZ203	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW		Q902	0501-002183	TR-SMALL SIGNAL;KTC9014,NPN,625mW,TO-92,TP,100	
DZ204	2001-000812	R-CARBON;5.6KOHM,5%,1/8W,AA,TP,-		Q903	0501-002183	TR-SMALL SIGNAL;KTC9014,NPN,625mW,TO-92,TP,100	
DZ205	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW		Q904	0504-000123	TR-DIGITAL;KSR1010,NPN,300mW,10K,TO-92,TP	
DZ208	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW		Q905	0504-000123	TR-DIGITAL;KSR1010,NPN,300mW,10K,TO-92,TP	
DZ301	0403-000660	DIODE-ZENER;MTZ22A,22V,20.15-21.2V,500mW,D		Q906	0504-000123	TR-DIGITAL;KSR1010,NPN,300mW,10K,TO-92,TP	
DZ302	0403-001039	DIODE-ZENER;MA2560,56V,52-60V,1W,DO-41,TP		Q907	0504-000125	TR-DIGITAL;KSR1012,NPN,300mW,47K,TO-92,TP	
DZ401	0403-000296	DIODE-ZENER;MTZ5.6B,5.6V,5.45-5.73V,500mW		Q908	0504-000123	TR-DIGITAL;KSR1010,NPN,300mW,10K,TO-92,TP	
DZ501	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW		QA01	0501-002183	TR-SMALL SIGNAL;KTC9014,NPN,625mW,TO-92,TP,100	
DZ502	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW		R200	2001-000780	R-CARBON;470OHM,5%,1/8W,AA,TP,-	
DZ503	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW		R201	2001-000005	R-CARBON;390OHM,5%,1/8W,AA,TP,-	
DZ504	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW		R202	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
DZ701	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW		R203	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
DZ702	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW		R204	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
DZ703	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW		R207	2001-000008	R-CARBON;15KOHM,5%,1/8W,AA,TP,-	
DZ704	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW		R208	2001-000005	R-CARBON;390OHM,5%,1/8W,AA,TP,-	
DZ705	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW		R209	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
DZ802	0403-000297	DIODE-ZENER;MTZ6.2B,6.2V,5.96-6.27V,500mW		R210	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
DZ803	1203-001217	IC-POS.ADJUST REG.;431,TO-92,3P,4.58MIL,PLASTIC,2		R211	2001-000331	R-CARBON;12KOHM,5%,1/8W,AA,TP,-	
DZ804	2001-001170	R-CARBON(S);6.8OHM,5%,1/2W,AA,TP,-		R212	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
DZ808	0403-000300	DIODE-ZENER;MTZ8.2B,8.2V,7.78-8.19V,500mW		R213	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
DZ809	0403-000296	DIODE-ZENER;MTZ5.6B,5.6V,5.45-5.73V,500mW		R214	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
DZ901	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW		R215	2001-001015	R-CARBON;9.1KOHM,5%,1/8W,AA,TP,-	
DZ902	0403-000296	DIODE-ZENER;MTZ5.6B,5.6V,5.45-5.73V,500mW		R216	2001-000490	R-CARBON;200OHM,5%,1/8W,AA,TP,-	
DZ903	1203-000451	IC-VOLTAGE REGULATOR;33,TO-92,3P,-,PLASTIC,31/35V,2		R217	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,-	
DZ905	0403-000296	DIODE-ZENER;MTZ5.6B,5.6V,5.45-5.73V,500mW		R218	2001-000591	R-CARBON;3.3KOHM,5%,1/8W,AA,TP,-	
DZ907	0403-000296	DIODE-ZENER;MTZ5.6B,5.6V,5.45-5.73V,500mW		R219	2001-000008	R-CARBON;15KOHM,5%,1/8W,AA,TP,-	
DZ909	0403-000551	DIODE-ZENER;MTZ3.9B,3.9V,3.89-4.16V,500mW		R221	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
F801	3601-000261	FUSE-FERRULE;250V,3.15A,TL,GLASS,5.2x20mm		R223	2001-000938	R-CARBON;680OHM,5%,1/8W,AA,TP,-	
F801A	3602-000114	FUSE-HOLDER;-;30mohm		R224	2001-000563	R-CARBON;27KOHM,5%,1/8W,AA,TP,-	
F801B	3602-000114	FUSE-HOLDER;-;30mohm		R225	2001-000554	R-CARBON;270OHM,5%,1/8W,AA,TP,-	
F802	3601-001086	FUSE-FERRULE;125V,5A,FA,GLASS,2.4x7.5mm		R226	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
IC201	1204-001440	IC-VIDEO SYSTEM;TDA8842,DIP,56P,300MIL,PLASTIC		R227	2004-001234	R-METAL;75Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
IC301	1204-000441	IC-IF CIRCUIT;TDA8356,SIP,9P,-,PLASTIC,40V,-		R229	2001-000890	R-CARBON;6.8KOHM,5%,1/8W,AA,TP,-	
IC501	1201-001159	IC-VIDEO AMP;6107,ZIP,9P,300MIL,SINGLE,-,PL		R230	2001-000793	R-CARBON;47OHM,5%,1/8W,AA,TP,-	
IC602	1201-000537	IC-AUDIO AMP;7057,ZIP,13P,-,DUAL,40dB,PLAST		R231	2001-000563	R-CARBON;27KOHM,5%,1/8W,AA,TP,-	
IC801	1203-001494	IC-PWM CONTROLLER;3S0680RF,TO3PF-5L,5,210,PLASTI		R232	2001-000356	R-CARBON;150KOHM,5%,1/8W,AA,TP,-	
IC802	1203-001531	IC-POS.FIXED REG.;7630,SIP,10P,-,PLASTIC,5.1/8V,		R234	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
IC901	AA13-30021J	IC-MCU;-;Z90233-R3943,8BIT,SDIP,CS-5		R236	2003-000634	R-METAL OXIDE(S);3.9Kohm,5%,1W,AA,TP,3.3x9mm	
IC902	1103-001105	IC-EEPROM;24C040,4Kx1BIT,DIP,8P,300MIL,1		R237	2001-000793	R-CARBON;47OHM,5%,1/8W,AA,TP,-	
J185	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm		R240	2001-000832	R-CARBON;510OHM,5%,1/8W,AA,TP,-	

Loc. No.	Code No.	Description ; Specification	Remark	Loc. No.	Code No.	Description ; Specification	Remark
R241	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-		R908	2001-000232	R-CARBON;1.3KOHM,5%,1/8W,AA,TP,-	
R242	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-		R909	2001-000605	R-CARBON;3.6KOHM,5%,1/8W,AA,TP,-	
R251	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-		R910	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
R252	2004-001914	R-METAL;39Kohm,2%,1/8W,AA,TP,1.8x3.5mm		R912	2001-000924	R-CARBON;680OHM,5%,1/8W,AA,TP,-	
R262	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-		R916	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R301	2004-001983	R-METAL(S);2.49Kohm,1%,1/2W,AA,TP,2.4x6.4		R917	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R302	2003-002010	R-METAL OXIDE(S);680ohm,5%,1W,AF,TP,3.9x10mm		R918	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R303	2001-000273	R-CARBON;100KOHM,5%,1/8W,AA,TP,-		R919	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
R305	2004-004087	R-METAL(S);1.5ohm,1%,1/2W,AA,TP,2.5x6.5mm		R920	2001-000864	R-CARBON;56KOHM,5%,1/8W,AA,TP,-	
R306	2008-000254	R-FUSIBLE(S);0.68ohm,5%,2W,AF,TP,3.9x10mm		R921	2001-001062	R-CARBON(S);10MOHM,5%,1/2W,AA,TP,-	
R307	2003-000649	R-METAL OXIDE(S);330ohm,5%,1W,AF,TP,3.3x9mm		R922	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R402	2003-000664	R-METAL OXIDE(S);33ohm,5%,2W,AF,TP,4x12mm		R923	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R403	2001-001114	R-CARBON(S);270OHM,5%,1/2W,AA,TP,-		R924	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,-	
R404	2008-000294	R-FUSIBLE(S);33ohm,5%,2W,AF,TP,3.9x10mm		R925	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,-	
R405	2001-000117	R-CARBON(S);68OHM,5%,1/2W,AA,TP,-		R926	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
R406	2001-000037	R-CARBON(S);330OHM,5%,1/2W,AA,TP,-		R927	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
R407	2001-001037	R-CARBON(S);0.39OHM,5%,1/2W,AA,TP,-		R928	2001-000066	R-CARBON(S);10KOHM,5%,1/2W,AA,TP,-	
R408	2001-000022	R-CARBON(S);33OHM,5%,1/2W,AA,TP,-		R929	2004-000253	R-METAL;11Kohm,1%,1/8W,AA,TP,1.8x3.2mm	
R409	2008-000204	R-FUSIBLE(S);0.22ohm,10%,1/2W,AF,TP,2.5x6.5		R930	2004-000218	R-METAL;10Kohm,1%,1/8W,AA,TP,1.8x3.2mm	
R412	2003-000664	R-METAL OXIDE(S);33ohm,5%,2W,AF,TP,4x12mm		R931	2004-000218	R-METAL;10Kohm,1%,1/8W,AA,TP,1.8x3.2mm	
R413	2003-000784	R-METAL OXIDE(S);7.5Kohm,5%,2W,AF,TP,4x12mm		R934	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,-	
R414	2003-000540	R-METAL OXIDE(S);1Kohm,5%,2W,AF,TP,4x12mm		R936	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-	
R415	2008-000206	R-FUSIBLE(S);1ohm,5%,1/2W,AF,TP,2.5x6.5mm		R937	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-	
R416	2008-000277	R-FUSIBLE;68ohm,5%,1/2W,AA,TP,4.7x11mm		R938	2001-000472	R-CARBON;2.7KOHM,5%,1/8W,AA,TP,-	
R417	2008-000256	R-FUSIBLE(S);1.5ohm,5%,2W,AA,TP,3.9x10mm		R940	2001-000660	R-CARBON;33KOHM,5%,1/8W,AA,TP,-	
R420	2004-001377	R-METAL(S);120Kohm,1%,1/2W,AA,TP,2.4x6.4mm		R946	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
R501M	2002-001008	R-COMPOSITION;1.8Kohm,5%,1/2W,AA,TP,3.7x9mm		R947	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
R502M	2002-001008	R-COMPOSITION;1.8Kohm,5%,1/2W,AA,TP,3.7x9mm		R948	2001-000241	R-CARBON;1.5KOHM,5%,1/8W,AA,TP,-	
R503	2002-001008	R-COMPOSITION;1.8Kohm,5%,1/2W,AA,TP,3.7x9mm		R951	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-	
R504	2001-001062	R-CARBON(S);10MOHM,5%,1/2W,AA,TP,-		R952	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R505	2008-000266	R-FUSIBLE(S);1ohm,5%,2W,AF,TP,3.9x10mm		R954	2001-000006	R-CARBON;2.4KOHM,5%,1/8W,AA,TP,-	
R510	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-		R955	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
R511	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-		R956	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
R512	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-		R960	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
R603	2001-000241	R-CARBON;1.5KOHM,5%,1/8W,AA,TP,-		R962	2001-000273	R-CARBON;100KOHM,5%,1/8W,AA,TP,-	
R604	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-		RA01	2001-000924	R-CARBON;680OHM,5%,1/8W,AA,TP,-	
R605	2001-000563	R-CARBON;27KOHM,5%,1/8W,AA,TP,-		RA02	2001-000241	R-CARBON;1.5KOHM,5%,1/8W,AA,TP,-	
R606	2001-000723	R-CARBON;4.3KOHM,5%,1/8W,AA,TP,-		RA03	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-	
R610	2001-000563	R-CARBON;27KOHM,5%,1/8W,AA,TP,-		RA04	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-	
R611	2001-000723	R-CARBON;4.3KOHM,5%,1/8W,AA,TP,-		RL901	AA59-60001U	MODULE-REMOCON;- ,ORC-50VF/SR-12V,38KHz,940nm,	
R701	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-		RW701	2011-001133	R-NETWORK;33K/24K/75x3.5%,1/8W,X,SIP6P,	
R702	2001-000969	R-CARBON;75OHM,5%,1/8W,AA,TP,-		RW702	2011-001098	R-NETWORK;75/75/1K/75OHM,5%,1/8W,- ,SIP5P,TP	
R703	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-		RX801	2002-001011	R-COMPOSITION;3.3Mohm,10%,1/2W,AA,TP,3.7x9mm	
R705	2001-000003	R-CARBON;330OHM,5%,1/8W,AA,TP,-		SFN02	2904-001063	FILTER-SAW AV;38.9MHz,SIP5K,TP,17dB,PAL-B/G,	
R706	2001-000221	R-CARBON;1.2KOHM,5%,1/8W,AA,TP,-		SW801	3403-001020	SWITCH-PUSH;250V,5A,DPST,OFF-ON-OFF	
R713	2001-000812	R-CARBON;5.6KOHM,5%,1/8W,AA,TP,-		SW901	3404-000244	SWITCH-TACT;15V,20mA,90-170gf,7.5x7mm,SPST	
R714	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-		SW902	3404-000244	SWITCH-TACT;15V,20mA,90-170gf,7.5x7mm,SPST	
R715	2001-000812	R-CARBON;5.6KOHM,5%,1/8W,AA,TP,-		SW903	3404-000244	SWITCH-TACT;15V,20mA,90-170gf,7.5x7mm,SPST	
R717	2001-000812	R-CARBON;5.6KOHM,5%,1/8W,AA,TP,-		SW904	3404-000244	SWITCH-TACT;15V,20mA,90-170gf,7.5x7mm,SPST	
R801	2003-000994	R-METAL OXIDE(S);33Kohm,5%,2W,AF,TP,3.9x10mm		SW905	3404-000244	SWITCH-TACT;15V,20mA,90-170gf,7.5x7mm,SPST	
R802	2003-000994	R-METAL OXIDE(S);33Kohm,5%,2W,AF,TP,3.9x10mm		T401	AA26-50001B	HORIZ.DRIVE;- ,7.1mH,102uH,10-20uH,YL081,ST	
R803	2001-001178	R-CARBON(S);680OHM,5%,1/2W,AA,TP,-		T444	AA26-30005L	TRANS-FLYBACK;- ,FSA38019S,14,125V	
R805	2003-001023	R-METAL OXIDE(S);120ohm,0.05,2W,AF,TP,3.9x10mm		T801	AA26-20007Q	TRANS-SWITCHING;- ,180-260V,125V/12.5V,EN,EER28	
R806	2002-001011	R-COMPOSITION;3.3Mohm,10%,1/2W,AA,TP,3.7x9mm		TU01	AA40-10006P	TUNER-V/S;TECC0949VG28B(S),PAL-B/G,TR,18	
R807	2002-001011	R-COMPOSITION;3.3Mohm,10%,1/2W,AA,TP,3.7x9mm		V999	3704-001089	SOCKET-CRT;TP,22.5PI,12PI,SN,-	
R808	2001-000022	R-CARBON(S);33OHM,5%,1/2W,AA,TP,-		X202	2801-000226	CRYSTAL-UNIT;3.579545MHz,20ppm,28-AAM,15pF,	
R809	2001-000622	R-CARBON;300KOHM,5%,1/8W,AA,TP,-		X203	2801-000274	CRYSTAL-UNIT;4.433619MHz,30ppm,28-AAM,20pF,	
R810	2003-000527	R-METAL OXIDE(S);18Kohm,5%,2W,AA,TP,4x12mm		X901	2801-000724	CRYSTAL-UNIT;6MHz,50ppm,28-AAM,20pF,40ohm,T	
R812	2003-000455	R-METAL OXIDE(S);100ohm,5%,2W,AA,TP,4x12mm		Z201	2903-000199	FILTER-CERAMIC;TR,6.5MHz,70KHz,- ,TP,-	
R814	2008-001073	R-FUSIBLE(S);0.68ohm,5%,2W,AA,TP,3.9x10mm		Z202	2903-000181	FILTER-CERAMIC;TR,5.5MHz,- ,-,TP,TPS5.5MB-TF	
R815	2008-001073	R-FUSIBLE(S);0.68ohm,5%,2W,AA,TP,3.9x10mm		Z204	2903-000184	FILTER-CERAMIC;BP,5.5MHz,+60KHz,6dB,- ,TP,-	
R816	2004-004089	R-METAL(S);123Kohm,1%,1/2W,AA,TP,2.5x6.5mm		Z205	2903-000202	FILTER-CERAMIC;BP,6.5MHz,+80KHz,6dB,- ,TP,-	
R817	2004-001983	R-METAL(S);2.49Kohm,1%,1/2W,AA,TP,2.4x6.4mm		Z206	2903-000184	FILTER-CERAMIC;BP,5.5MHz,+60KHz,6dB,- ,TP,-	
R818	2004-001371	R-METAL(S);1.5Kohm,1%,1/2W,AA,TP,2.4x6.4mm		Z210	2903-000200	FILTER-CERAMIC;BP,6.5MHz,+70KHz,6dB,- ,TP,-	
R819	2004-001390	R-METAL(S);1Kohm,2%,1/2W,AA,TP,2.4x6.4mm			AA39-20010D	LEAD-CONNECTOR,ASSY;- ,YFHH800-01,S,1P,400,1617#22	
R820	2008-000299	R-FUSIBLE(S);47ohm,5%,2W,AF,TP,3.9x10mm					
R821	2008-000266	R-FUSIBLE(S);1ohm,5%,2W,AF,TP,3.9x10mm					
R822	2001-001150	R-CARBON(S);470KOHM,5%,1/2W,AA,TP,-					
R823	2001-001150	R-CARBON(S);470KOHM,5%,1/2W,AA,TP,-					
R825	2003-001040	R-METAL OXIDE(S);47Kohm,5%,2W,AF,TP,3.9x10mm		*	AA95-90028N	ASSY-PCB,A/V FRONT;DP,39,85,66,- ,SCT13B,AA41-10903	
R901	2001-000832	R-CARBON;510OHM,5%,1/8W,AA,TP,-		CE01	2401-001840	C-AL;100uF,20%,16V,GP,TP,6.3x11.5	
R902	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-		CE03	2401-001989	C-AL;4.7uF,20%,50V,BP,TP,5x11.5	
R903	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-		CE06	2202-000862	C-CERAMIC,MLC-AXIAL;390pF,10%,50V,Y5P,TP,3.5x11.9,-	
R904	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-		CE07	2202-000222	C-CERAMIC,MLC-AXIAL;3.3nF,20%,16V,Y5P,TP,- ,7.5	
R905	2001-000241	R-CARBON;1.5KOHM,5%,1/8W,AA,TP,-		CN702	AA39-20461C	LEAD CONNECTOR-ASSY;- ,YBNH250-11,67096-011,11,300,	
R906	2001-000472	R-CARBON;2.7KOHM,5%,1/8W,AA,TP,-		JA702	3722-000506	JACK-RCA;2P;3.6mm,- ,AG	
R907	2001-000995	R-CARBON;820OHM,5%,1/8W,AA,TP,-					

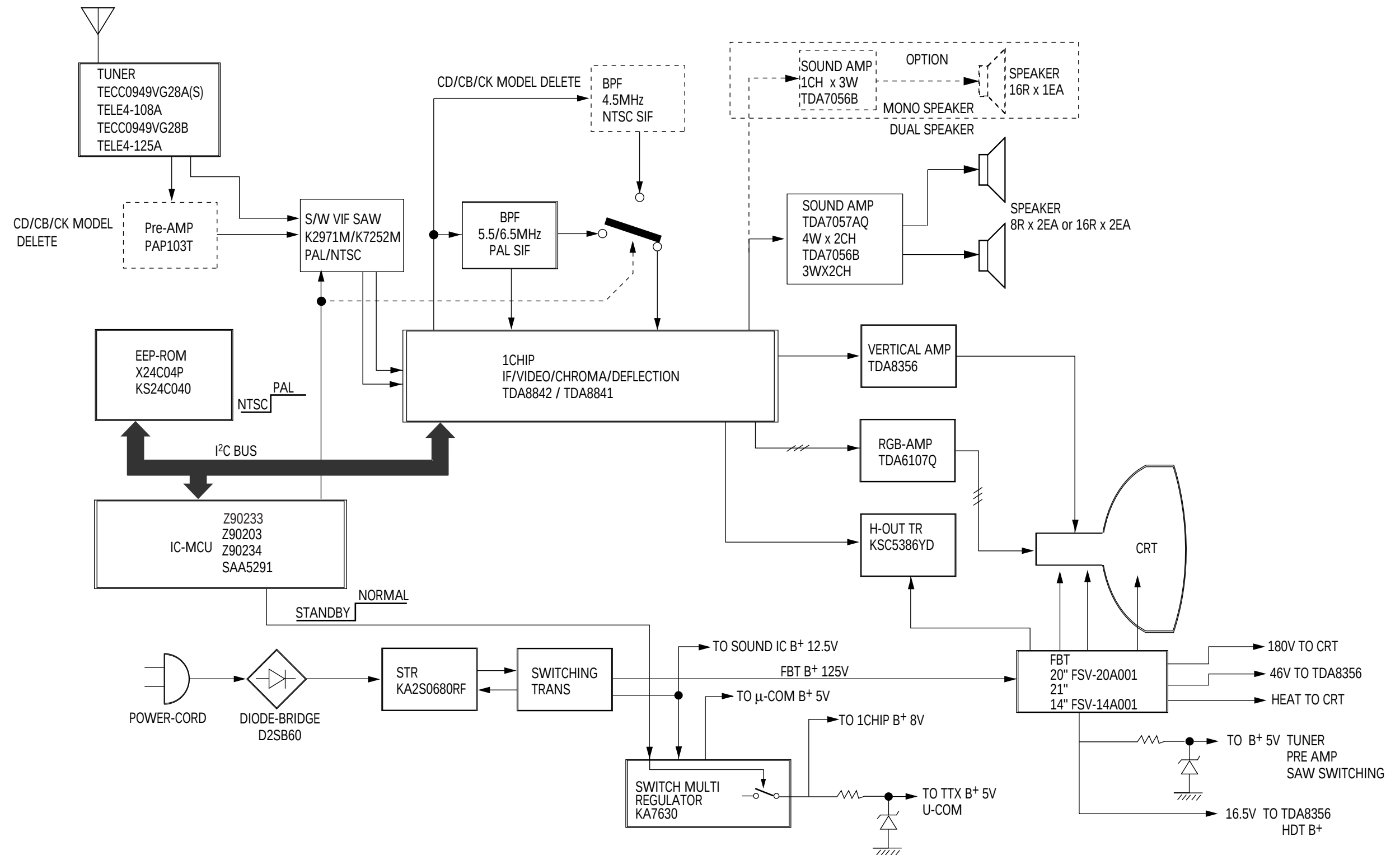
ASSY-PCB,A/V FRONT

Electric Parts List

Loc. No.	Code No.	Description ; Specification	Remark	Loc. No.	Code No.	Description ; Specification	Remark
JE601	3722-000143	JACK-PHONE;1P(VER),3.4mm,AG,BLK,NO					
LE01	2701-000158	INDUCTOR-AXIAL;22uH,10%,2.5x3.4mm					
QE01	0501-000283	TR-SMALL SIGNAL;KSA539,PNP,400mW,TO-92,TP,120-					
RE01	2001-001153	R-CARBON(S);47OHM,5%,1/2W,AA,TP,-					
RE02	2001-001153	R-CARBON(S);47OHM,5%,1/2W,AA,TP,-					
RE03	2001-000010	R-CARBON;68KOHM,5%,1/8W,AA,TP,-					
RE04	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-					
RE05	2001-000009	R-CARBON;20KOHM,5%,1/8W,AA,TP,-					
ASSY-POWER,CORD							
△	AA39-10001G	POWER-CORD;- ,KKP-419C,KLCE-2F,2.286m,HOUS					
	AA61-20070A	HOLDER-CORD;- ,PP,V0,BLK,KE-0002					
REMOCON							
*	AA59-10107N	REMOCON;- ,TM59,SS,SZM173EA,24,-,L/GR					
ASSY-SPEAKER							
	3001-001034	SPEAKER;6W,8ohm,90dB,140Hz					
	AA39-20505N	LEAD CONNECTOR-ASSY;- ,YSH025-04,REC,4P,350,550mm,1					
ASSY-CRT							
△	AA03-10001D	CRT-COLOR;- ,A34KQV42X,+380MG,14,90DEG,5					
	AA27-00001A	MAGNET-CONVERGENCE;- ,JH225-06A,22.5MM					
△	AA27-50004X	DEFLECTION-YOKE;- ,DSE-1422FL(G),14/A34KQV42X,					
	AA63-60028A	SPACER-DY;NEOPRENE,- ,BLK,V0 W12,-,-					
ASSY-ACCESSORY							
	AA26-90001C	TRANS-MATCHING;- ,300ohm/75ohm,PAL,40-890MHz					
	AA42-10001V	ANT-ROD;- ,3S,620mm,BRN,UL/CSA					
	AA68-11289A	MANUAL-USERS;S15A,N-RUSSIA,W/O TTX,B5,W/P 1					

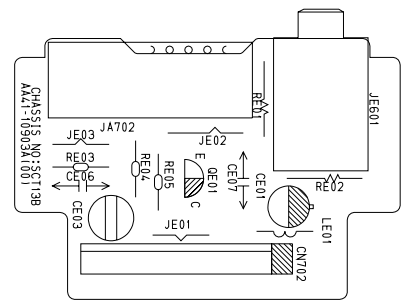
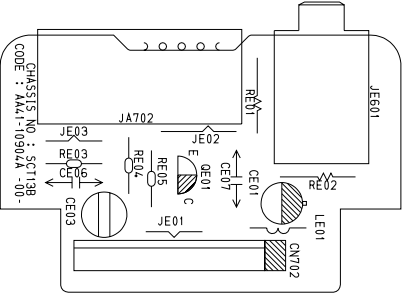
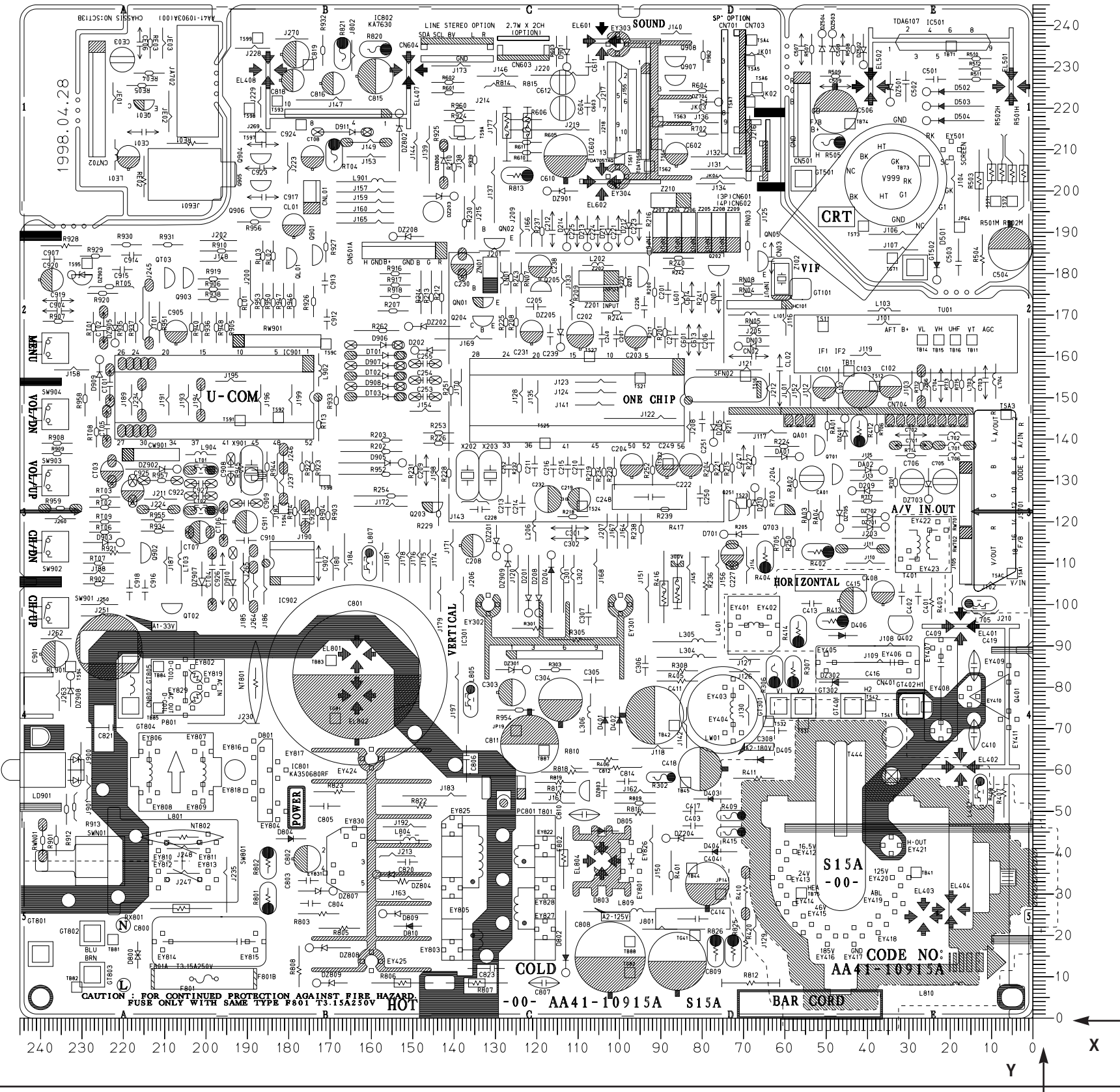
8. Block Diagram

8-1 S15A



10. PCB Layout

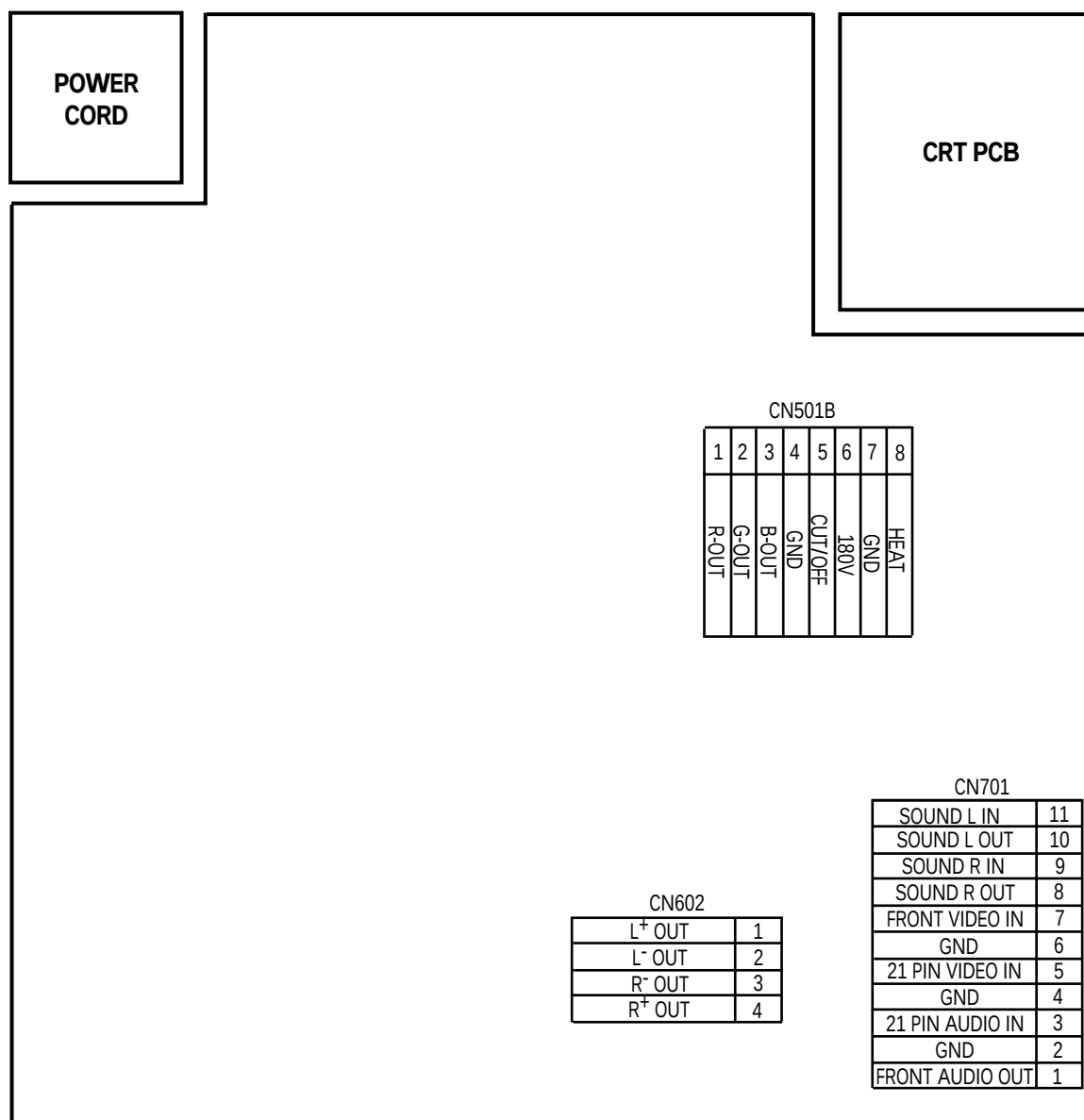
10-1 PCB Main



Loc. No.	X	Y	Loc. No.	X	Y
DIODE					
D201	122	98	DZ705	46	118
D202	149	161	DZ802	153	218
D204	116	112	DZ803	107	57
D205	77	139	DZ804	158	34
D208	119	98	DZ806	142	211
D209	43	127	DZ807	169	30
D210	67	128	DZ808	175	17
D211	102	186	DZ809	173	8
D212	97	188	DZ901	117	200
D213	107	186	DZ902	207	132
D214	112	186	DZ903	232	179
D401	103	78	DZ905	222	163
D402	100	78	DZ907	201	100
D403	84	53	DZ908	232	82
D404	83	40	DZ909	127	113
D405	72	62	IC		
D406	39	92	HC101	59	172
D501	23	178	IC201	86	141
D502	25	224	IC301	99	100
D503	25	220	IC501	39	225
D504	25	217	IC602	100	235
D701	74	117	IC801	160	13
D800	216	19	IC802	151	229
D801	188	65	IC901	175	142
D802	113	11	IC902	183	114
D803	104	38	TRANSISTOR		
D805	97	45	Q201	95	176
D809	157	25	Q202	78	182
D810	157	22	Q203	147	124
D901	112	230	Q204	135	169
D903	220	115	Q205	116	175
D905	152	134	Q251	73	120
D906	153	162	Q401	17	94
D907	153	157	Q402	34	95
D908	153	152	Q701	48	129
D909	225	159	Q703	57	121
D910	193	100	Q901	174	182
D911	161	214	Q902	215	110
DA01	56	135	Q903	205	176
DA02	36	132	Q904	189	209
DN03	71	162	Q905	189	202
DT01	153	160	Q906	189	196
DT02	153	155	Q907	89	228
DT03	153	150	Q908	89	232
DZ201	129	111	QA01	52	136
DZ202	151	167	QE01	217	222
DZ203	140	198	QL01	180	181
DZ204	88	43	QN01	135	174
DZ205	114	162	QN02	132	188
DZ208	154	189	QN05	66	180
DZ301	122	84	QT02	210	100
DZ302	54	81	QT03	210	176
DZ401	45	145			
DZ501	34	221			
DZ502	41	230			
DZ503	48	238			
DZ504	51	238			
DZ701	35	118			
DZ702	35	121			
DZ703	25	125			
DZ704	76	221			

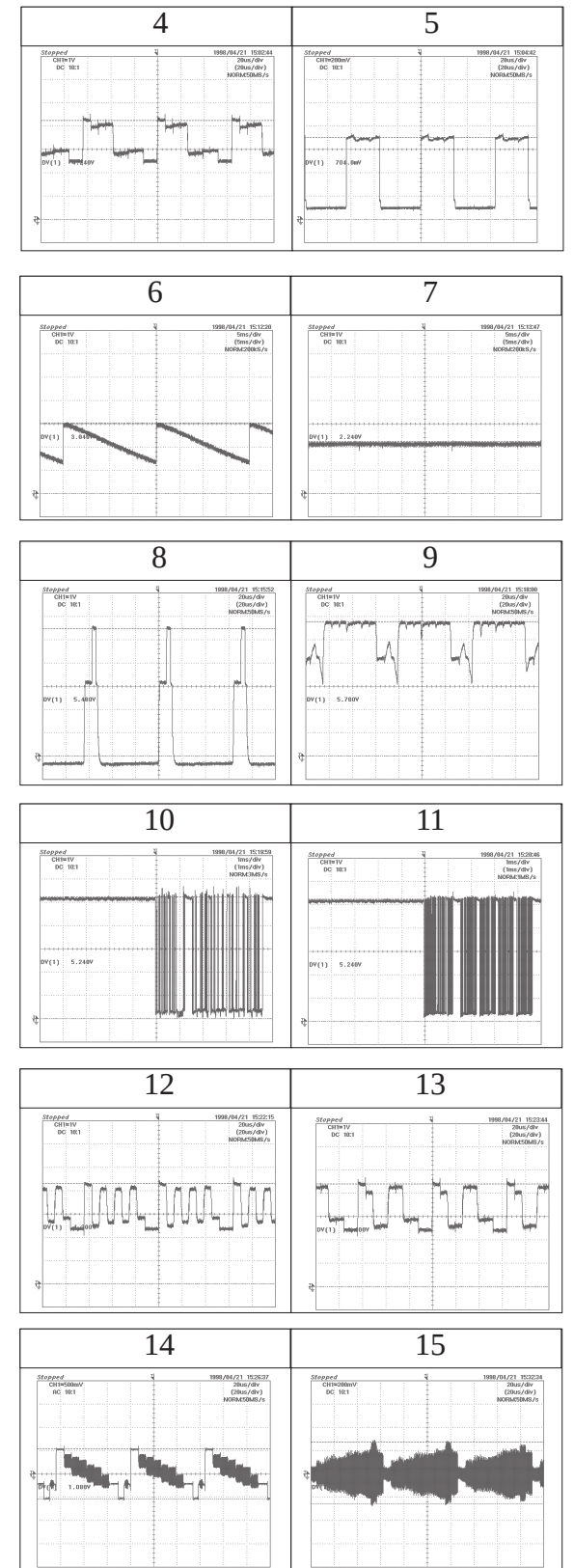
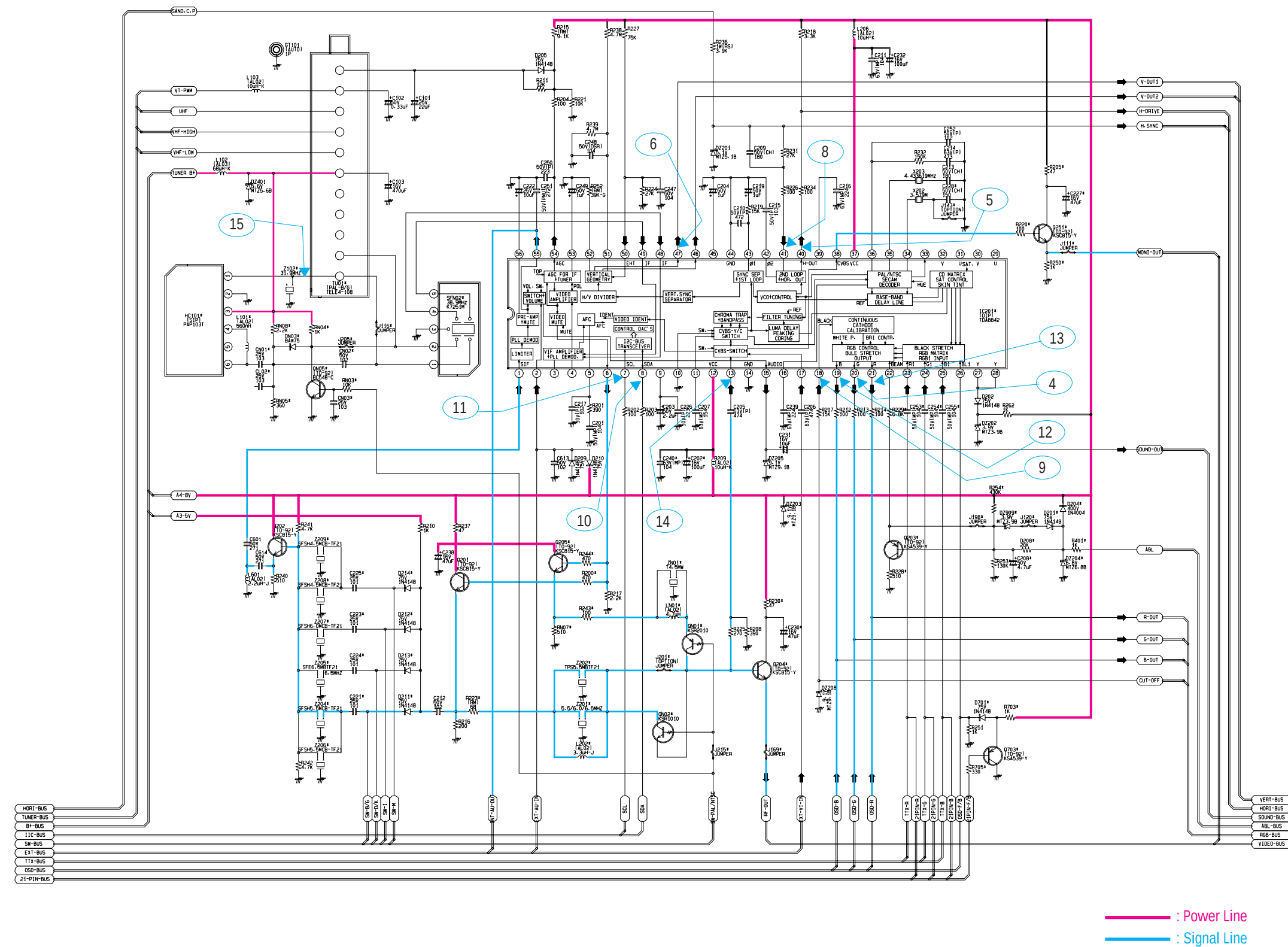
10. Wiring Diagram

10-1 S15A

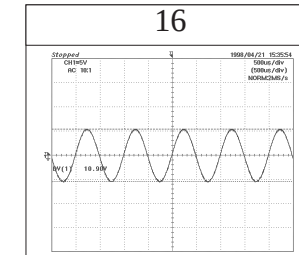
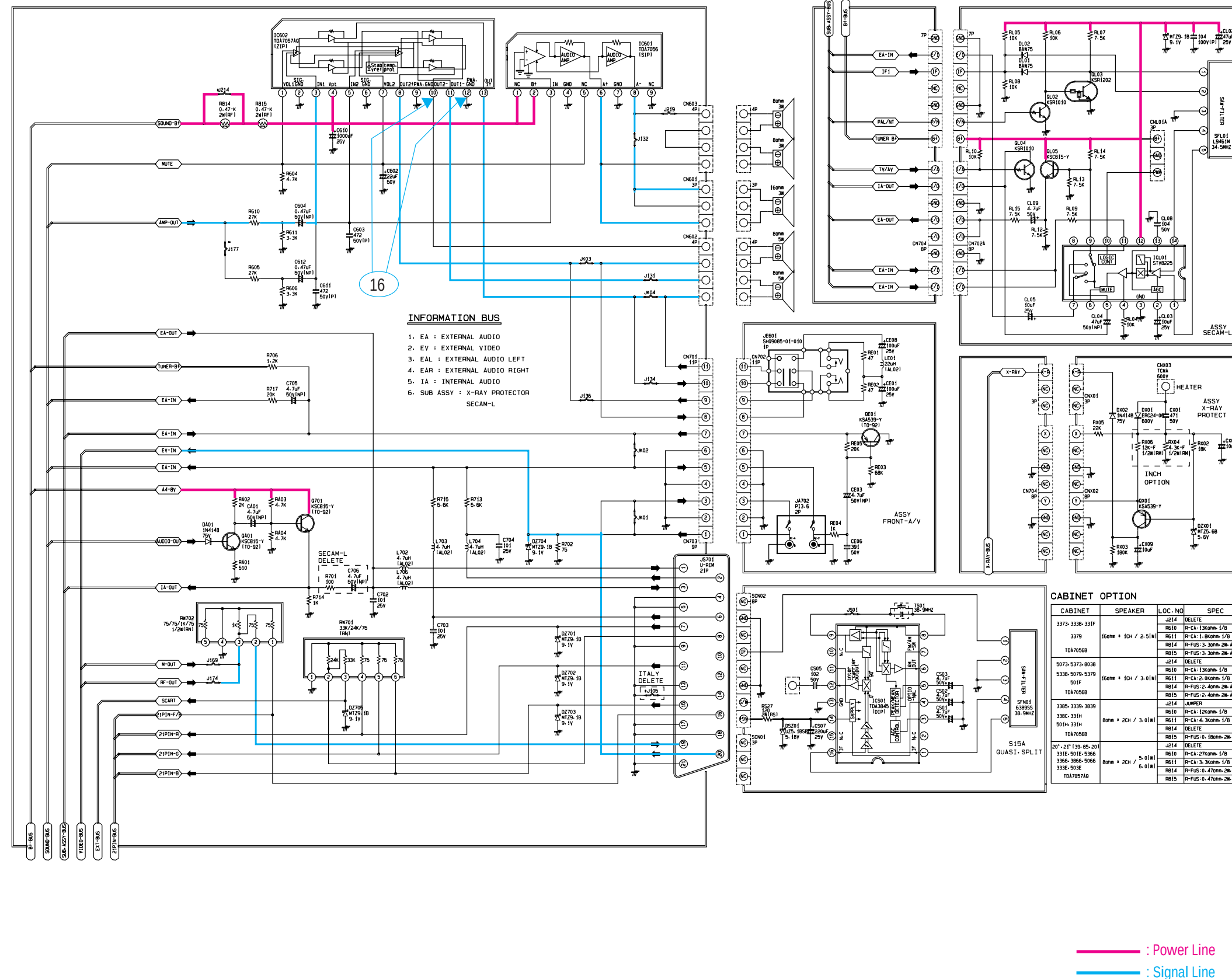


11. Schematic Diagrams

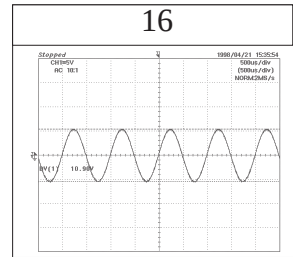
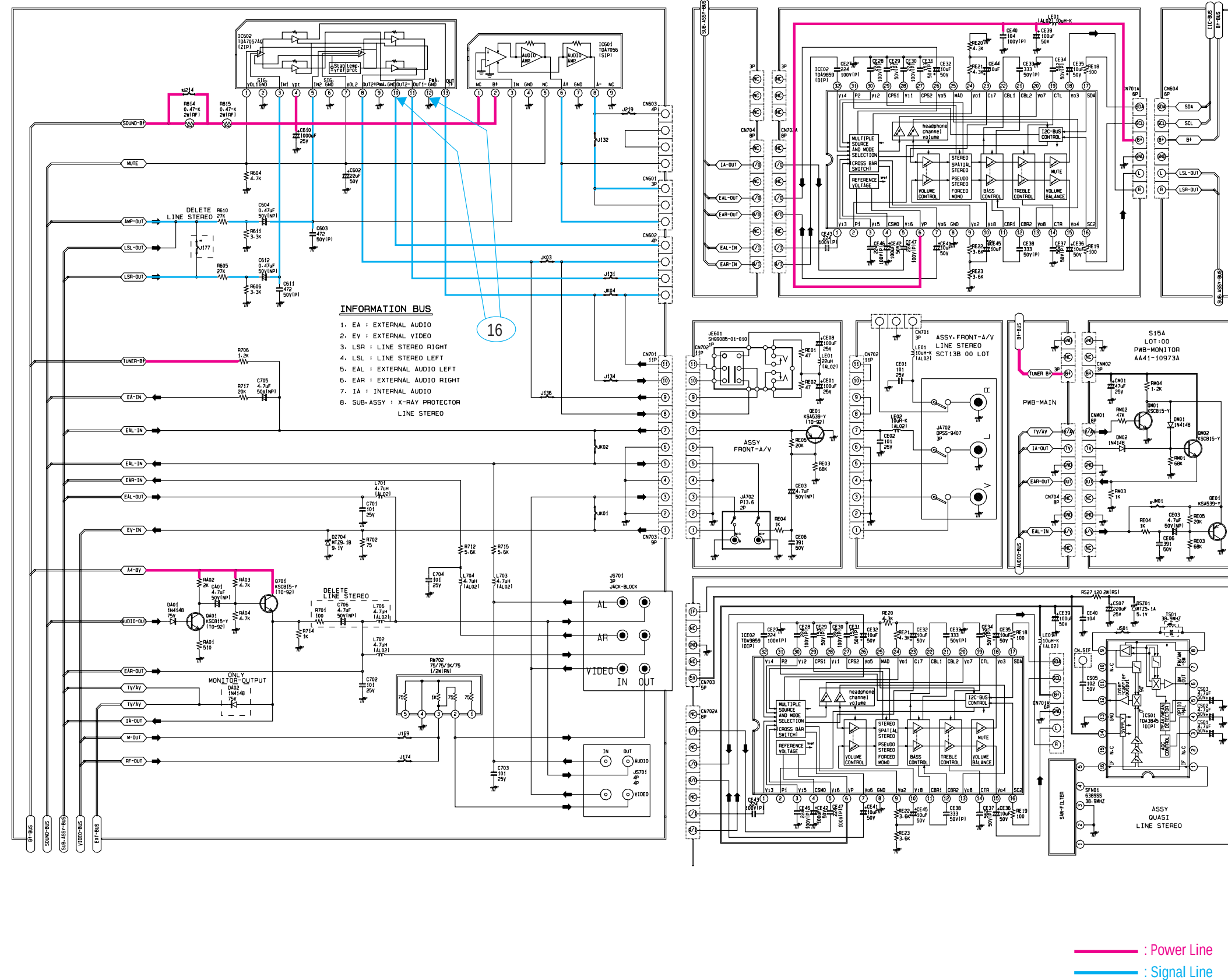
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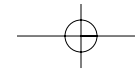


11-2 SOUND, EXT-A/V (Europe/Africa)



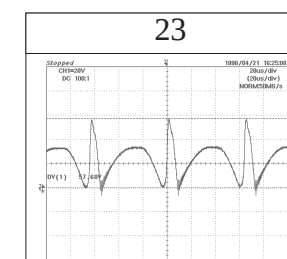
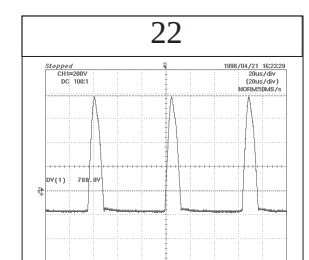
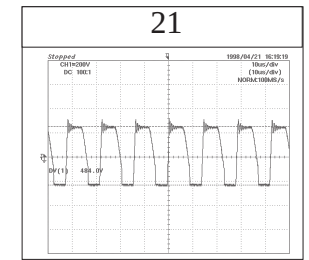
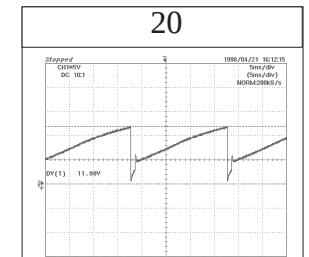
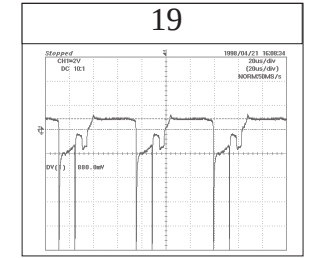
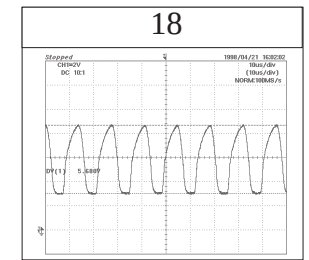
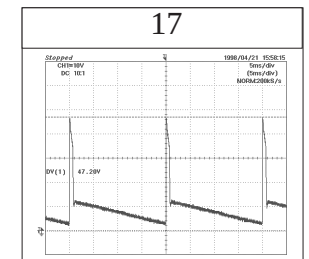
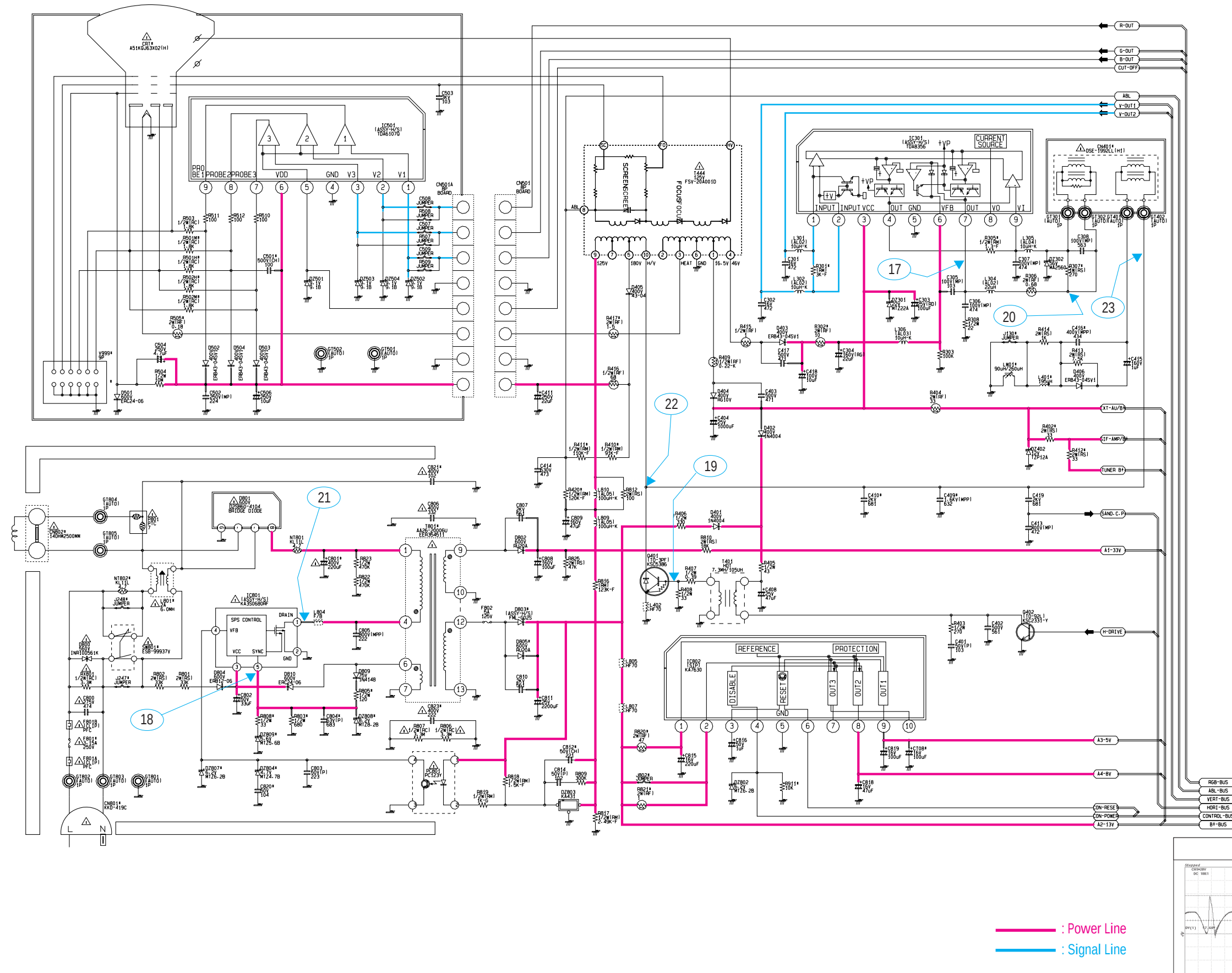
11-3 SOUND, EXT-A/V (Middle East / Asia)

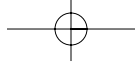




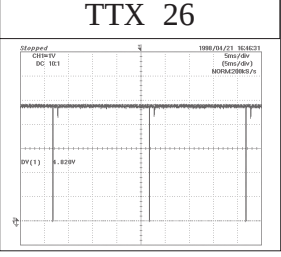
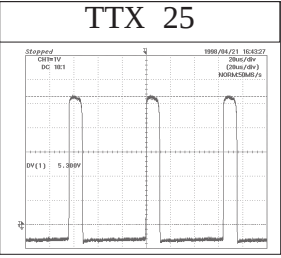
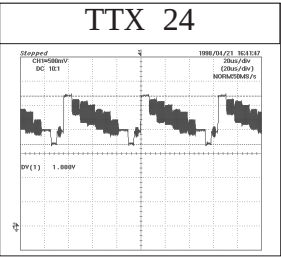
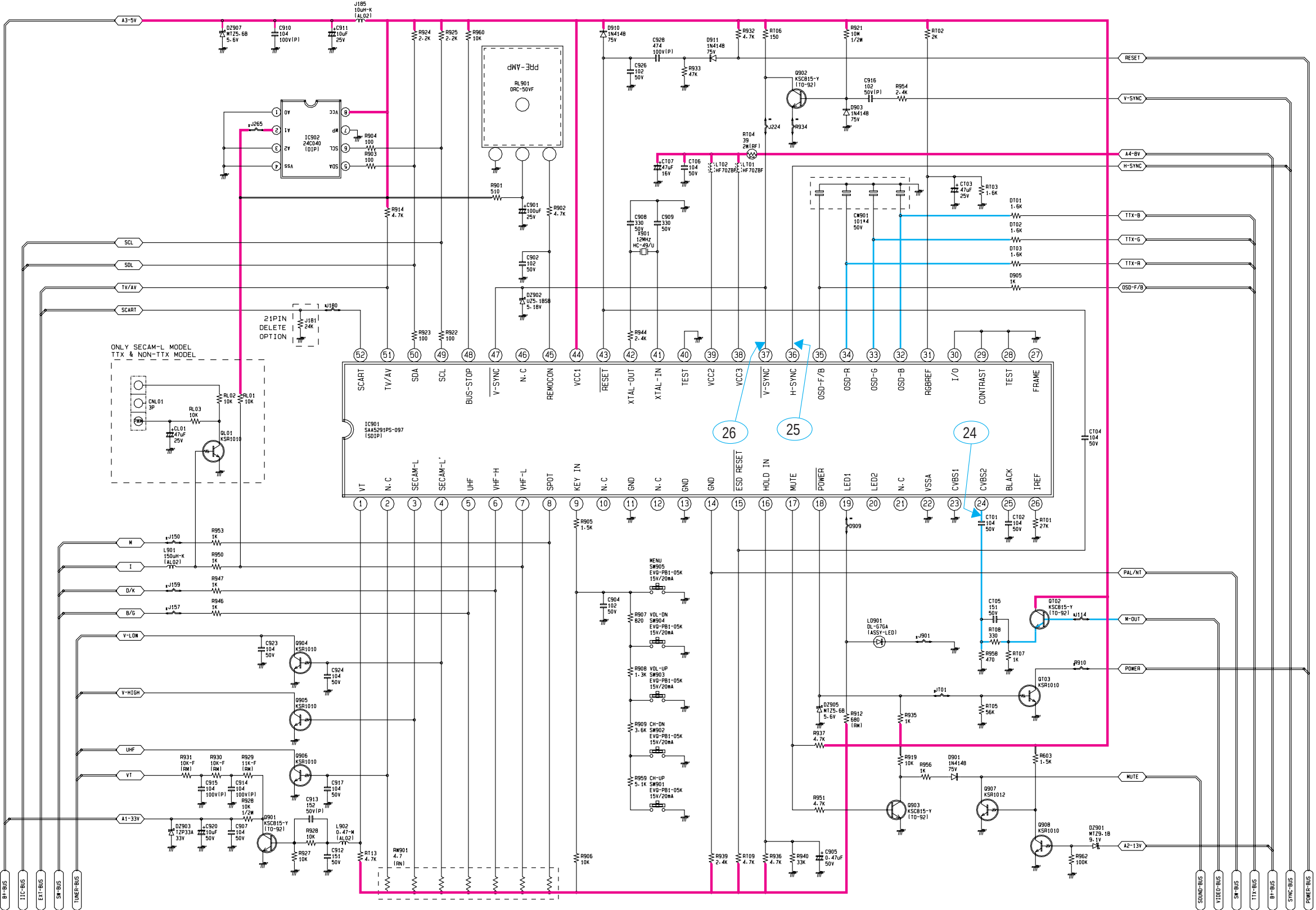
Schematic Diagrams

11-4 POWER / CRT / VERTICAL / HORIZONTAL



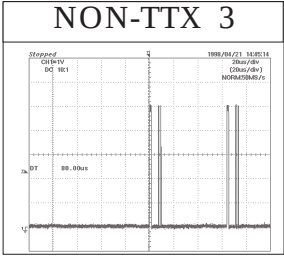
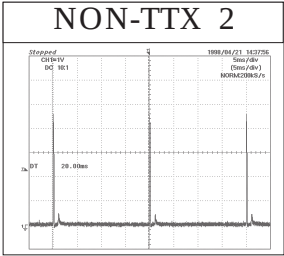
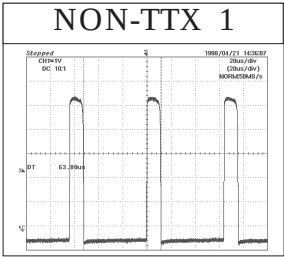
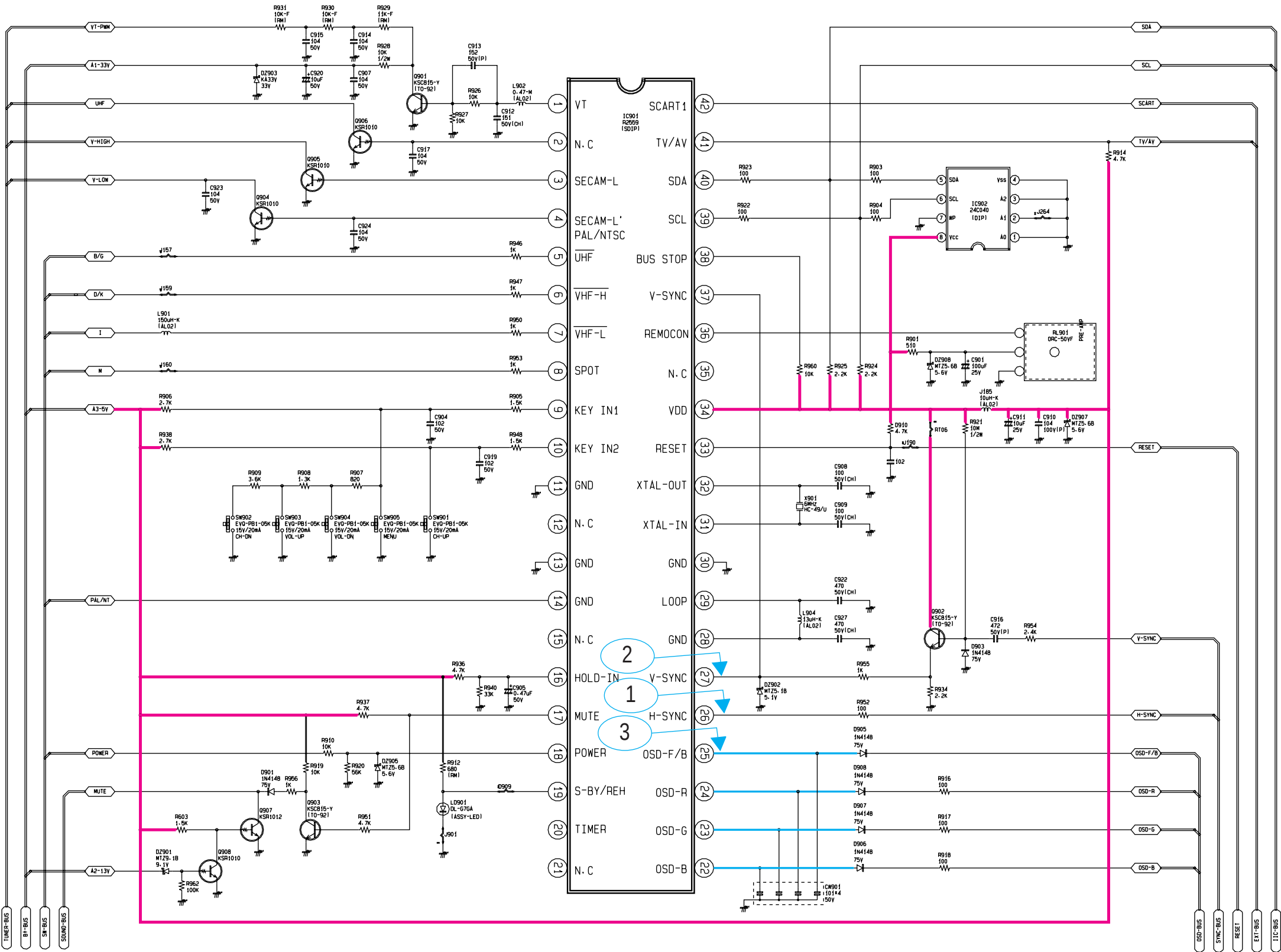


11-5 MICOM (TTX)



Schematic Diagrams

11-6 MICOM (NON-TTX)



Power Line
Signal Line

1. Precautions

Follow these safety, servicing and ESD precautions to prevent damage and protect against potential hazards such as electrical shock and X-rays.

1-1 Safety Precautions

1. Be sure that all of the built-in protective devices are replaced. Restore any missing protective shields.
2. When reinstalling the chassis and its assemblies, be sure to restore all protective devices, including: nonmetallic control knobs and compartment covers.
3. Make sure that there are no cabinet openings through which people—particularly children—might insert fingers and contact dangerous voltages. Such openings include the spacing between the picture tube and the cabinet mask, excessively wide cabinet ventilation slots, and improperly fitted back covers.

If the measured resistance is less than 1.0 megohm or greater than 5.2 megohms, an abnormality exists that must be corrected before the unit is returned to the customer.

4. Leakage Current Hot Check (Figure 1-1):
Warning: Do not use an isolation transformer during this test. Use a leakage-current tester or a metering system that complies with American National Standards Institute (ANIS C101.1, Leakage Current for Appliances), and Underwriters Laboratories (UL Publication UL1410, 59.7).
5. With the unit completely reassembled, plug the AC line cord directly into the power outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: antennas, handle brackets, metal cabinets, screwheads and control shafts. The current measured should not exceed 0.5 milliamp. Reverse the power-plug prongs in the AC outlet and repeat the test.

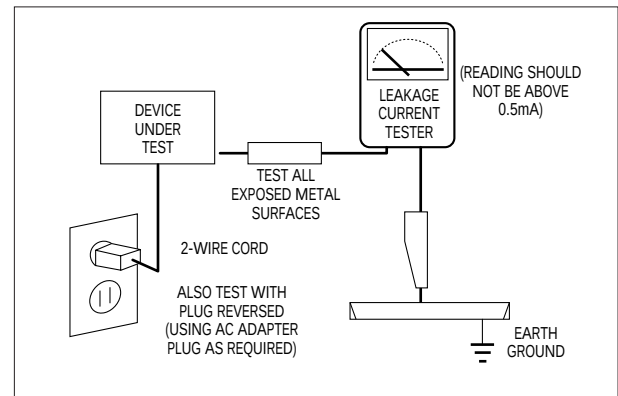


Fig. 1-1 AC Leakage Test

6. Antenna Cold Check:
With the unit's AC plug disconnected from the AC source, connect an electrical jumper across the two AC prongs. Connect one lead of the ohmmeter to an AC prong. Connect the other lead to the coaxial connector.
7. X-ray Limits:
The picture tube is especially designed to prohibit X-ray emissions. To ensure continued X-ray protection, replace the picture tube only with one that is the same type as the original. Carefully reinstall the picture tube shields and mounting hardware; these also provide X-ray protection.
8. High Voltage Limits:
High voltage must be measured each time servicing is done on the B+, horizontal deflection or high voltage circuits. Correct operation of the X-ray protection circuits must be reconfirmed whenever they are serviced.
(X-ray protection circuits also may be called "horizontal disable" or "hold-down".)

Heed the high voltage limits. These include the X-ray Protection Specifications Label, and the Product Safety and X-ray Warning Note on the service data schematic.

1-1 Safety Precautions (Continued)

9. High voltage is maintained within specified limits by close-tolerance, safety-related components and adjustments. If the high voltage exceeds the specified limits, check each of the special components.
10. Design Alteration Warning:
Never alter or add to the mechanical or electrical design of this unit. Example: Do not add auxiliary audio or video connectors. Such alterations might create a safety hazard. Also, any design changes or additions will void the manufacturer's warranty.
11. Hot Chassis Warning:
Some TV receiver chassis are electrically connected directly to one conductor of the AC power cord. If an isolation transformer is not used, these units may be safely serviced only if the AC power plug is inserted so that the chassis is connected to the ground side of the AC source.

To confirm that the AC power plug is inserted correctly, do the following: Using an AC voltmeter, measure the voltage between the chassis and a known earth ground. If the reading is greater than 1.0V, remove the AC power plug, reverse its polarity and reinsert. Re-measure the voltage between the chassis and ground.
12. Some TV chassis are designed to operate with 85 volts AC between chassis and ground, regardless of the AC plug polarity. These units can be safely serviced only if an isolation transformer inserted between the receiver and the power source.
13. Some TV chassis have a secondary ground system in addition to the main chassis ground. This secondary ground system is not isolated from the AC power line. The two ground systems are electrically separated by insulating material that must not be defeated or altered.
14. Components, parts and wiring that appear to have overheated or that are otherwise damaged should be replaced with parts that meet the original specifications. Always determine the cause of damage or overheating, and correct any potential hazards.
15. Observe the original lead dress, especially near the following areas: Antenna wiring, sharp edges, and especially the AC and high voltage power supplies. Always inspect for pinched, out-of-place, or frayed wiring. Do not change the spacing between components and the printed circuit board. Check the AC power cord for damage. Make sure that leads and components do not touch thermally hot parts.
16. Picture Tube Implosion Warning:
The picture tube in this receiver employs "integral implosion" protection. To ensure continued implosion protection, make sure that the replacement picture tube is the same as the original.
17. Do not remove, install or handle the picture tube without first putting on shatterproof goggles equipped with side shields. Never handle the picture tube by its neck. Some "in-line" picture tubes are equipped with a permanently attached deflection yoke; do not try to remove such "permanently attached" yokes from the picture tube.
18. Product Safety Notice:
Some electrical and mechanical parts have special safety-related characteristics which might not be obvious from visual inspection. These safety features and the protection they give might be lost if the replacement component differs from the original—even if the replacement is rated for higher voltage, wattage, etc.

Components that are critical for safety are indicated in the circuit diagram by shading, () or ().
Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications. A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.

1-2 Servicing Precautions

Warning1: First read the "Safety Precautions" section of this manual. If some unforeseen circumstance creates a conflict between the servicing and safety precautions, always follow the safety precautions.

Warning2: An electrolytic capacitor installed with the wrong polarity might explode.

1. Servicing precautions are printed on the cabinet. Follow them.
2. Always unplug the unit's AC power cord from the AC power source before attempting to: (a) Remove or reinstall any component or assembly, (b) Disconnect an electrical plug or connector, (c) Connect a test component in parallel with an electrolytic capacitor.
3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the portion around the serviced part has not been damaged.
5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
6. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500V) to the blades of the AC plug.

The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
7. Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.
8. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

1-3 Precautions for Electrostatically Sensitive Devices (ESDs)

1. Some semiconductor (“solid state”) devices are easily damaged by static electricity. Such components are called Electrostatically Sensitive Devices (ESDs); examples include integrated circuits and some field-effect transistors. The following techniques will reduce the occurrence of component damage caused by static electricity.
2. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. (Be sure to remove it prior to applying power—this is an electric shock precaution.)
3. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of electrostatic charge.
4. Do not use freon-propelled chemicals. These can generate electrical charges that damage ESDs.
5. Use only a grounded-tip soldering iron when soldering or unsoldering ESDs.
6. Use only an anti-static solder removal device. Many solder removal devices are not rated as “anti-static”; these can accumulate sufficient electrical charge to damage ESDs.
7. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
8. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.
9. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting a foot from a carpeted floor can generate enough static electricity to damage an ESD.

2. Specifications and IC Data

2-1 Specifications

Television System:

MODEL	SYSTEM
CI	PAL-I (UHF)
CII	PAL-I (VHF/UHF)
CX	PAL-B/G, SECAM-B/G
CK	PAL-B/G, D/K, SECAM-B/G, D/K
CW	PAL-B/G, D/K, SECAM-B/G, D/K, NT 4.43
CS	PAL-B/G, D/K, SECAM-B/G, D/K, NT4.43, NT3.58

Channels:

System Band	PAL/SECAM-B/G,I	PAL, SECAM- D/K	SECAM-K1, PAL-D	NTSC - M
VHF	2 - 12	1 - 13	2 - 9	2 - 13
UHF	21 - 69	21 - 69	13 - 57	14-69

Intermediate Frequencies (MHz) :

SYSTEM IF Carrier Frequency	PAL/ SECAM- B/G	PAL/SECAM-D/K, SECAM-K1	PAL - I	NTSC - M
Picture IF Carrier	38.90	38.90	38.90	38.90
Sound IF Carrier	33.40	32.40	32.90	34.40
Color Sub Carrier	34.47	34.47	34.47	35.32

Picture Tube:

14 Inch	A34KQV42X	Quick start, in-line-gun, Black stripe, 90°degree deflection
20 Inch	A48KRD82X(H)	
21 Inch	A51KQJ63X	

Power Requirements:

AC 100~260V, 50/60Hz

Antenna Input Impedance:

VHF, UHF : Telescopic dipole antenna (75 ohm unbalanced type)

Speaker Impedance

8 ohm, 5W+5W (Dual Type)
16 ohm, 3W (Monitor Type & Dual Type)

2-2 IC Line Up

Table 2-1 IC Line-Up			
Loc. No	Specification	Description	Remark
HC101	PAP103	IF PRE-AMP	
IC201	TDA8842 TDA8841	PAL/SECAM-B/G, D/K, NTSC PAL-B/G, D/K, NTSC	Philips
IC301	TDA8356	VERTICAL OUTPUT	
IC501	TDA6107Q	RGB DRIVE AMP	
IC601	TDA7056B	SOUND-AMP (3W x 1CH or 3W x 2CH)	
IC602	TDA7057AQ	SOUND-AMP (5W x 2CH)	Dual Type
IC801	KA3S0680RF	POWER IC (STR)	
IC802	KA7630	CUSTOM REGULATOR (5V, 8V)	
IC901	SZM173EA	W/O TTX, English/French/Arabian	Zilog (Non TTX)
	SZM173AR	W/O TTX, English/Arabian	
	SZM173EV	W/O TTX, English/Vietnamese/Indonesian/Malay	
	SZM173EC	W/O TTX, English/Chinese	
	SZM173ET	W/O TTX, English/Thai	
	SZM173EW	W/O TTX, English/German/French/Dutch/Italian/Spanish, Swedish/Yugo/Greek/Croatian	
	SZM173EE	W/O TTX, English/Romanian/Hungarian/Polish/Czech/Bulgarian	
	SZM173ER	W/O TTX, English/Russian	Philips (TTX)
	SPM175EE	TTX, West : English/German/French/Dutch/Italian/Spanish/Swedish East : English/Czech/Croatian/Romanian/Hungarian/Polish	
	SPM175E	TTX, English/French/Swiss	
	SPM175ER	TTX, English/Russian/Bulgarian	
	SPM175EP	TTX, English/Iranian	
	SPM175EA	TTX, English/French/Arabian	
	SPM175EG	TTX, English/Greek/Yugo	
IC902	24C04/KS24C040	EEPROM	
PC801	TCET1108 / LTV817B	PHOTO COUPLER	

2-3 Semiconductor Base Diagrams

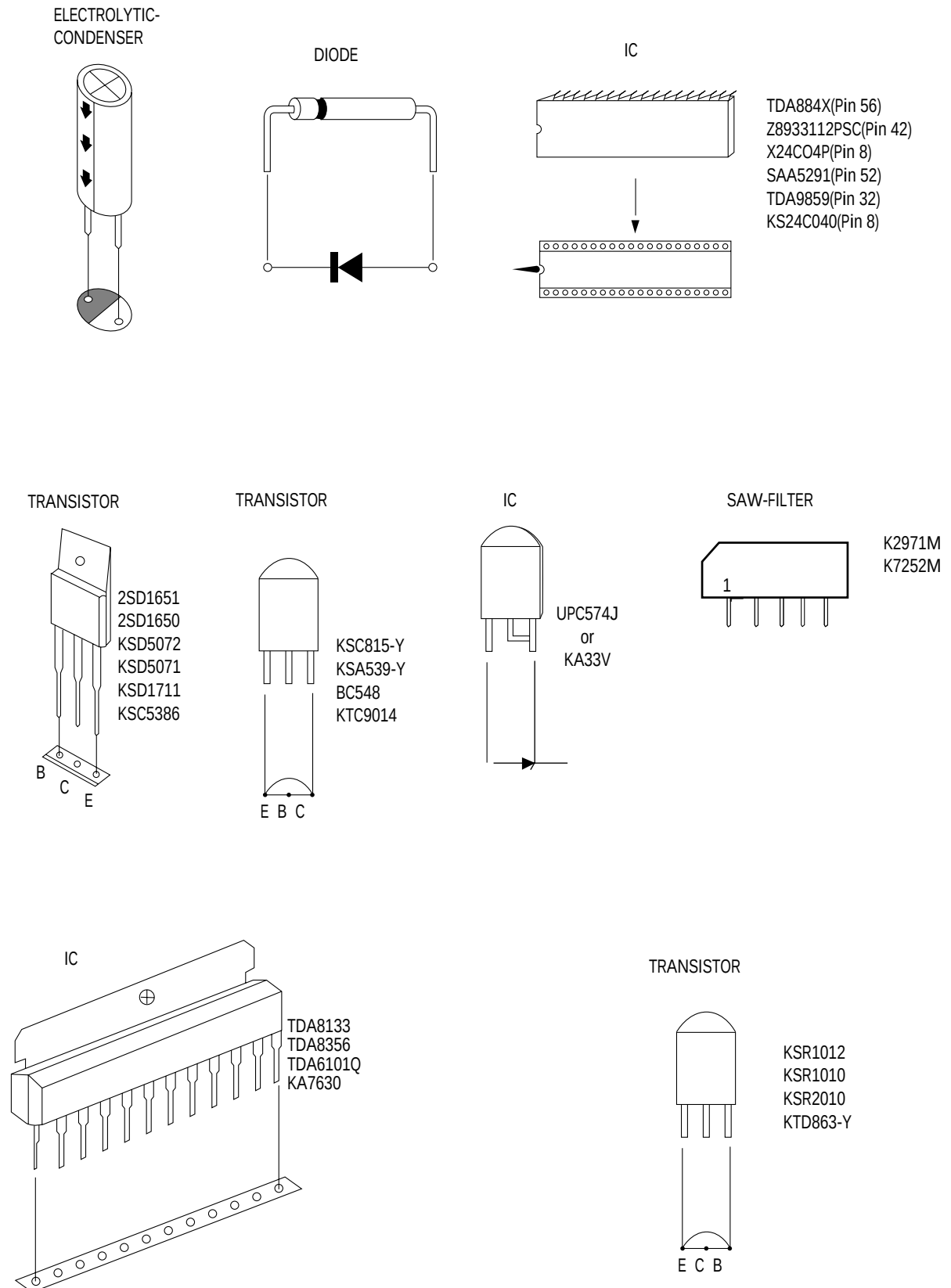
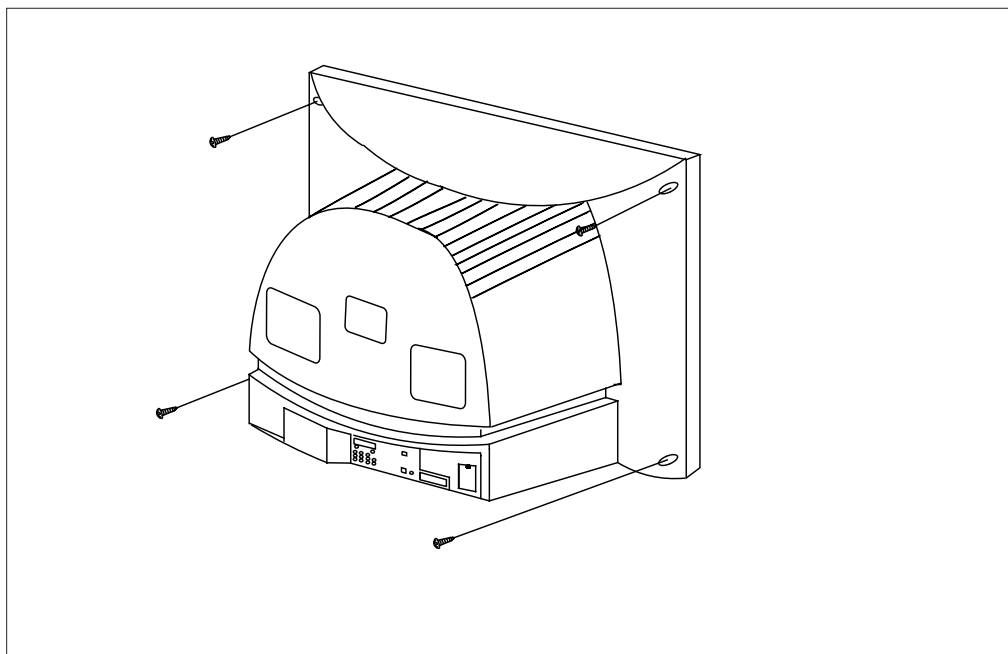


Fig. 2-1 Semiconductor Base Diagrams

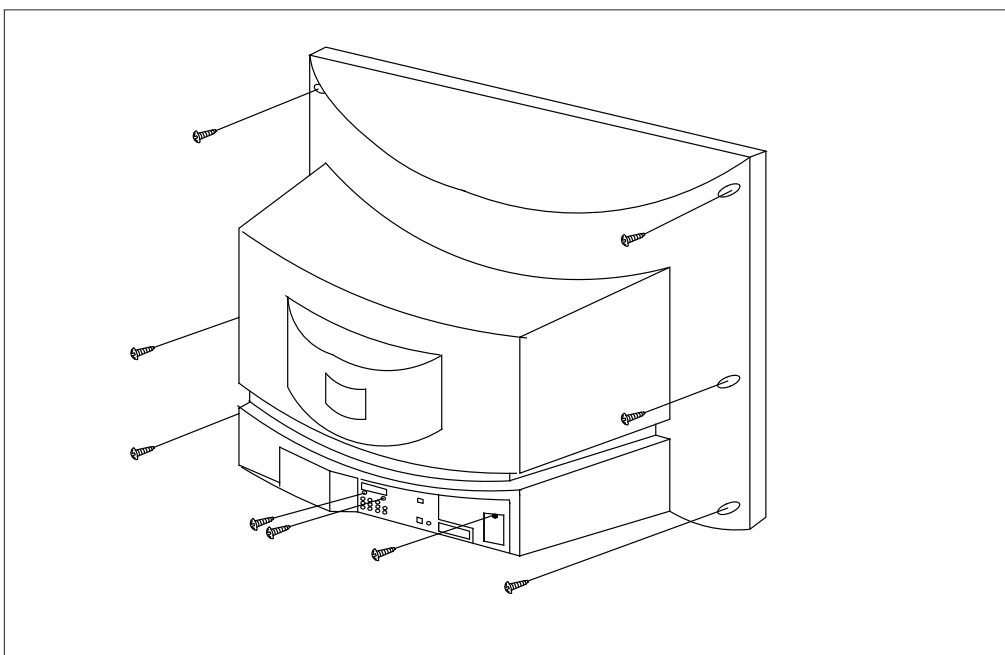
MEMO

3. Disassembly and Reassembly

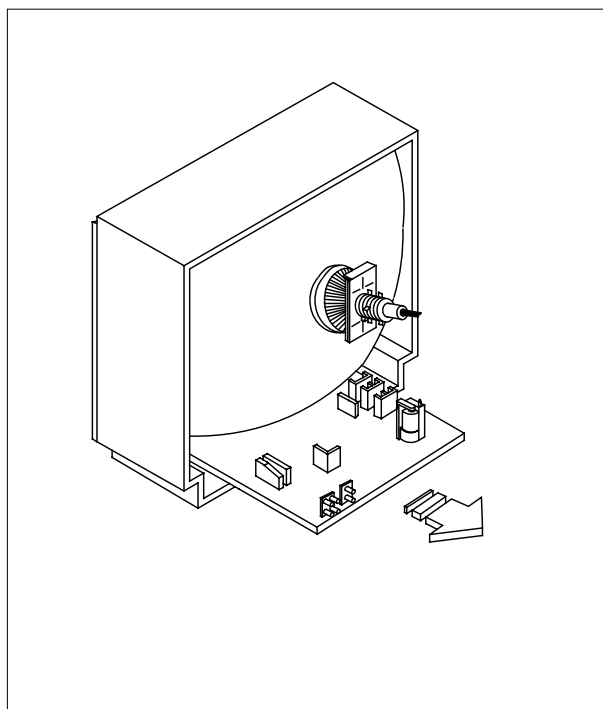
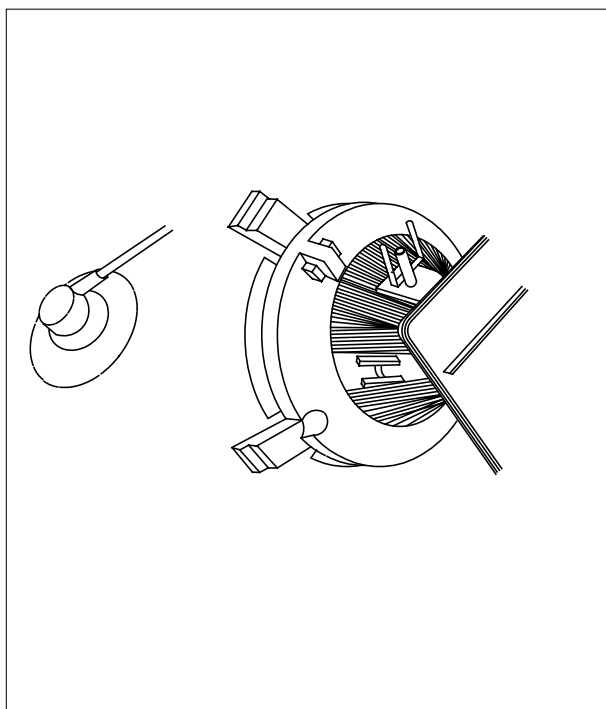
3-1 Back Cover Removal



1. After removing the screws, press the tension rib and pull the cabinet backwards.
2. To reassemble, press the tension rib (see diagram).



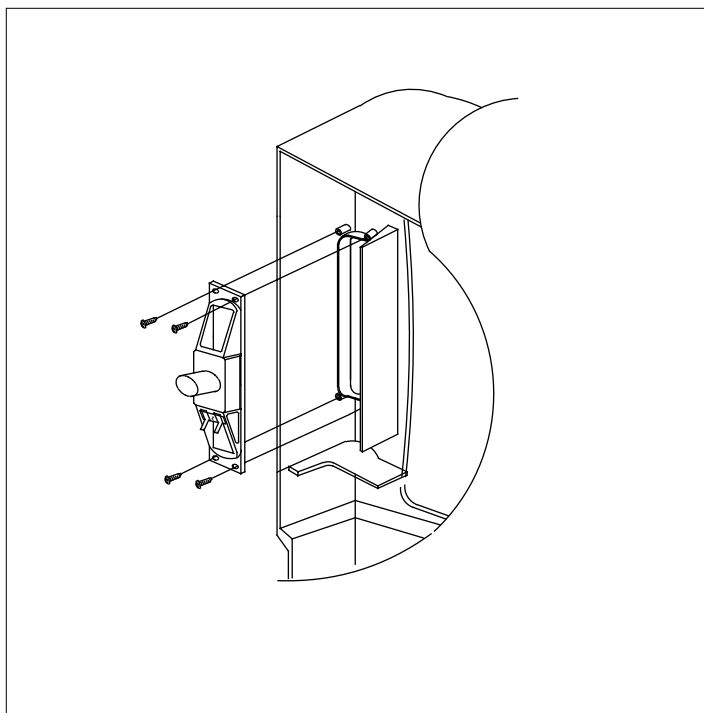
3-2 Main Board Removal



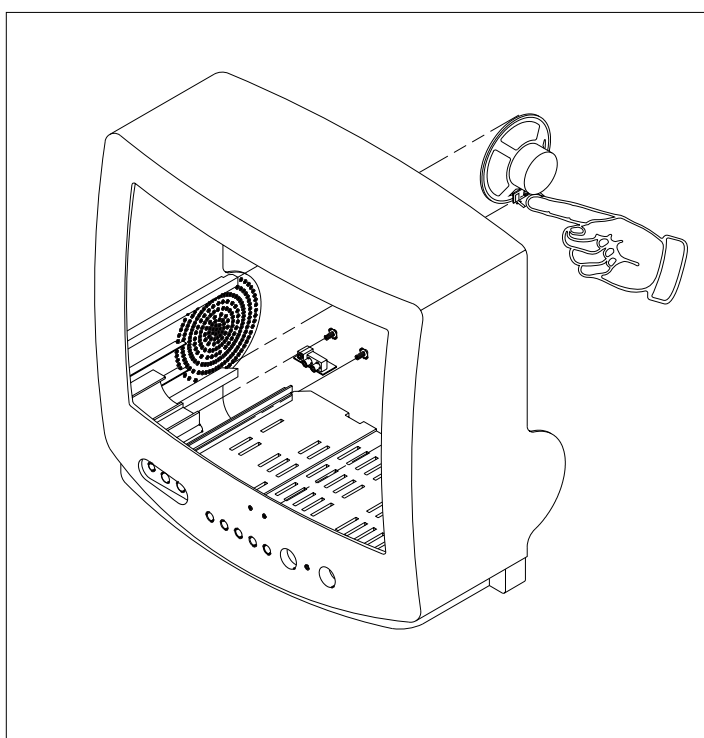
1. Separate the socket board from the CRT neck.
2. Remove the Anode Cap from the CRT.
3. Remove the main board by pulling it with both hands.

Warning: The FBT is charged with high voltage.
Before removing the Anode Cap, discharge the voltage
through one of the heat sinks on the main board.

3-3 Speaker Removal

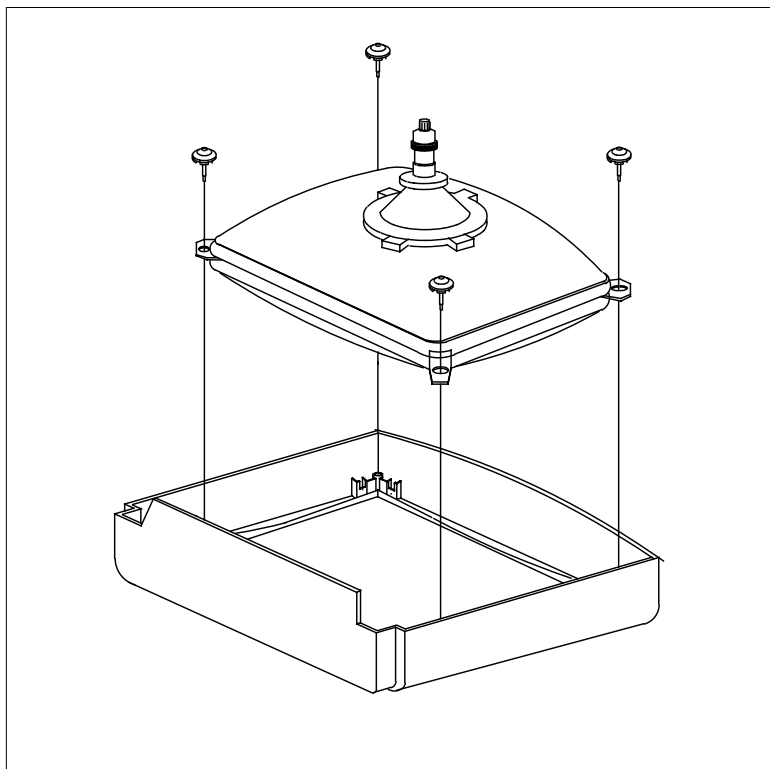


1. Remove the speaker by pressing the tension rib.



1. Remove the screws.
2. Remove the speaker by pressing the tension rib.

3-4 CRT Removal



1. Spread a soft mat on the floor. Place the TV set face down.
2. Remove the 4 nuts mounting the CRT to the front cabinet. Lift the CRT.
3. Caution: Because of the high vacuum and large surface area of the picture tube, be careful while handling it: (1) Always lift the picture tube by grasping it firmly around the faceplate, (2) Never lift the tube by its neck. (3) Do not scratch the picture tube or apply excessive pressure. Fractures of the glass may cause an implosion.

4. Alignment and Adjustments

4-1 Preadjustment

4-1-1 Factory Mode

1. Do not attempt these adjustments in the Video Mode.
2. The Factory Mode adjustments are necessary when either the EEPROM (IC902) or the CRT is replaced.
3. Do not tamper with the "Adjustment" screen of the Factory Mode menu. This screen is intended only for factory use.

4-1-2 When EEPROM (IC902) Is Replaced

1. When IC902 is replaced all adjustment data revert to initial values. It is necessary to re-program this data.
2. After IC902 is replaced, warm up the TV for 10 seconds.

4-1-3 When CRT Is Replaced

1. Make the following adjustments AFTER setting up after setting up purity and convergence :
 - White Balance
 - Sub-Brightness
 - Vertical Center
 - Vertical Size
 - Horizontal Size
 - Fail Safe (This adjustment must be the last step).
2. If the EEPROM or CRT is replaced, set PVA to 45 (factory mode) and set SC as follows.
 - 14, 16 inch : 0
 - 20 inch : 10
 - 21 inch : 12

4-2 Factory/Service Mode

4-2-1 Procedure for the "Adjustment" Mode

1. This mode uses the standard remote control. The Service Mode is activated by entering the following remote-control sequence :
 - (1) SLEEP→FACTORY.
 - (2) STAND-BY→DISPLAY→P.STD→MUTE→POWER ON.
2. The "SERVICE (FACTORY)" message will be displayed. The Service Mode has four components: Adjustment, Test Pattern, Option Bytes and Reset.
3. Access the Adjustment Mode by pressing the "VOLUME" keys (Up or Down). The adjustment parameters are listed in the accompanying table, and selected by pressing the CHANNEL keys (▲, ▼).
4. Selection sequences for the all system:
 - DOWN or UP key:
 - AGC>VCO>SBT>SCT>SCR>SC>RG>GG>BG>CDL>BLU>PSL>PVS>PVA>PHS>NSR>STT
5. The VOLUME keys increase or decrease the adjustment values (stored in the non-volatile memory) when Adjustment Mode is cancelled.
6. Cancel the Adjustment Mode by re-pressing the "FACTORY" or "Power OFF" keys.

4-2-2 Main Adjustment Parameter

Table 4-1 Main Adjustment Parameter (Zilog, Philips μ -com)				
FUNCTION	OSD ABBREVIATION	RANGE	INITIAL DATA	REMARK
AUTO GAIN CONTROL	AGC	0 ~ 63 STEP	10	TDA8842 TDA8841
VOLTAGE CONTROL OSCILLATOR	VCO	0 ~ 128 STEP	80	
		0 ~ 1 STEP	1 (For East Europe)	
SUB BRIGHT	SBT	0 ~ 23 STEP	8	
SUB CONTRAST	SCT	0 ~ 23 STEP	10	
SUB COLOR	SCR	0 ~ 23 STEP	10	
S-CORRECTION	SC	0 ~ 63 STEP	12	
RED DRIVE GAIN	RG	0 ~ 63 STEP	47	
GREEN DRIVE GAIN	GG	0 ~ 63 STEP	32	
BLUE DRIVE GAIN	BG	0 ~ 63 STEP	34	
CATHODE DRIVE LEVEL	CDL	0 ~ 7 STEP	4	
BLUE STRETCH MODE	BLU	0 ~ 3 STEP	0	
PAL VERTICAL SLOPE	PSL	0 ~ 63 STEP	32	
PAL VERTICAL SHIFT	PVS	0 ~ 63 STEP	32	
PAL VERTICAL AMPLITUDE	PVA	0 ~ 63 STEP	42	
PAL HORIZONTAL SHIFT	PHS	0 ~ 63 STEP	40	
NTSC SUB COLOR	NSR	0 ~ 23 STEP	7	
SUB TINT	STT	1 ~ 13 STEP	0	
TTX SUB-CONTRAST	TSS	0 ~ 63 STEP	16 (Only TTX Model)	

NOTE : PVS,PVA, PHS, parameters must be aligned using the 50Hz vertical-field rates.

4-2-3 Test Pattern (Aging Mode)

1. This mode can be used during servicing, or for confirming that the convergence and purity adjustments are correct.
2. Access the Test Pattern parameters by pressing a CHANNEL keys (▲, ▼) while the Service Mode is on. The cursor will move to the test pattern. Press the VOLUME keys. On-screen display:

• WHITE — NON -TTX MICOM ONLY

• AGING — TTX MICOM

3. AGING Mode (Reference Only)

This pattern is used for pre-heating the CRT during manufacturing
—it is accessed in the factory by twice pressing the “SLEEP → FACTORY→FACTORY” key, then white pattern will be displayed.

Even if the TV power is cut off, the Aging Mode is not cancelled, The aging mode is cancelled by repressing the “FACTORY” key or pressing the local “CH UP/DOWN” keys.

4-2-4 Option Bytes

In the Service Mode, various can be selected via the Option Bytes (8 bits each). Example:

SYSTEM OSD DISPLAY		BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
BYTE 0 : 8	-			L (BIT : 0)	H (BIT : 8)	L (BIT : 0)	L (BIT : 0)	L (BIT : 0)
BYTE 1 : 0	-	L (BIT : 0)	L (BIT : 0)	L (BIT : 0)	L (BIT : 0)	L (BIT : 0)	L (BIT : 0)	L (BIT : 0)

TDA8842, CK SYSTEM, RCA JACK SYSTEM OSD DISPLAY

BYTE 0 : 11	—————	L (BIT : 1)	H (BIT : 0)	L (BIT : 0)	H (BIT : 0)	L (BIT : 1)
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4-2-4 (A) NON-TTX MICOM (SZM-173EC) OPTION BYTE (FOR CHINA/SINGAPORE/GERMAN ARMY)

	Destination	BYTE 0	BYTE 1
MP (Massproduction) OPTION BYTE	China	15	58
	Singapore	57	58
	German Army	57	18
	Hotel (CB)	59	1A

BYTE	BIT	LOW (0)		HIGH (1)		Application MICOM	
B Y T E 0	D7	NOT USED				MUST LOW	
	D6	TV : NORMAL → ZOOM A/V :NORMAL → ZOOM		TV: NORMAL → ZOOM → 16:9 A/V : NORMAL → ZOOM		MUST = LOW : China (only) 16 : 9 (Delete)	
	D5	NOT USED				MUST = LOW	
	D4	CH Up/down functional in the A/V Mode (SCART Jack)		CH Up/down not functional in the A/V Mode (RCA Jack)		MUST = HIGH	
	D3	Sound-I System Used		Sound-I System Not Used			
	D2	D2	D1	COLOR SYSTEM		SOUND SYSTEM	Remark
		0	0	● CB : NO OSD			China MP : CD German Army : CS 
		0	1	● CW : ■ RF : AUTO → PAL → SECAM → NT4.43 ■ A/V : AUTO → PAL → SECAM → NT4.43 → NT3.58		"?" → B/G → D/K → I	
	D1	1	0	● CD : ■ RF : AUTO → PAL → NT4.43 ■ A/V : AUTO → PAL → NT4.43 → NT3.58		"?" → D/K ↔ I	
		1	1	● CS : ■ RF: AUTO → PAL → SECAM → NT4.43 → NT3.58 ■ A/V: AUTO → PAL → SECAM → NT4.43 → NT3.58		"?" → B/G → D/K → (I) → NT- M	
	D0	TDA8374A		TDA8842		IC201 (ONE-CHIP) OPTION	
B Y T E 1	D7	TV OUT		MONITOR OUT			
	D6	English ONLY		English/Chinese		MUST = HIGH	
	D5	AFT ON (always)		AFT OFF (after fine tuning)		BASIC = LOW	
	D4	Existing Sharpness level (when using the TDA6108 RGB AMP)		Sharpness level up (when using the TDA6107Q RGB AMP)		BASIC = HIGH	
	D3	No Auto Power On		Auto Power On		BASIC = HIGH	
	D2	NTSC : 25K Hz (NTSC TABLE) PAL : 50K Hz (PAL TABLE)		NTSC : 25KHz (NTSC TABLE) PAL : 27KHz (NTSC TABLE)			
	D1	Others		HOTEL			
	D0	NOT USED MUST LOW					

- Function Required :
1. PICTURE OFF (after 15 minutes) during no signal
 2. AUDIO MUTE during no signal
 3. BLUE SCREEN ON/OFF
 4. TIMER CLOCK ON/OFF
 5. No CHILD LOCK

4-2-4 (B) NON-TTX MICOM (SZM-173EW/EE) OPTION BYTE (FOR EUROPE)

		Destination		BYTE 0		BYTE 1		
MP OPTION BYTE		United Kingdom		C3		98		
		France/Swiss		45		9A		
		Western Europe (except UK)		45		98		
		Eastern Europe		41		58		
		Ireland (CII)		43		98		
BYTE	BIT	LOW(0)		HIGH(1)		Remark		
B Y T E 0	D7	3 BAND		UHF ONLY		HIGH (UK only)		
	D6	TV : NORMAL → ZOOM A/ : NORMAL → ZOOM		TV : NORMAL → ZOOM → 16:9 A/V : NORMAL → ZOOM		MUST = HIGH		
	D5	MUST LOW				POLAND OPTION - R 913 : 680Ω added - J901 : delete		
	D4	CH Up/down functional in the A/V Mode (SCART Jack)		CH Up/down not functional in the A/V Mode (RCA Jack)		MUST = LOW		
	D3	NOT USED				MUST = LOW		
	D2	D2	D1	SOUND SYSTEM		COLOR SYSTEM		Destination
		0	0	"?" → B/G ↔ D/K : CK MODEL		AUTO : NO OSD		Eastern Europe/France/Swiss
	D1	0	1	I ONLY (NO OSD) : CI,CII MDL				United Kingdom
		1	0	B/G ONLY (NO OSD) : CB,CX MDL				Western Europe
		1	1	NOT USED				
D0	TDA8374A		TDA8842		IC201 (ONE-CHIP) OPTION			
B Y T E 1	D7			English/German/Dutch/Italian/Spnish/ Swedish/Croatian/Yugo/Greek/French		Western Europe (SZM-173EW/EW1)		
	D6			English/Romanian/Hungarian/Polish/ Czech/Bulgarian		Eastern Europe (SZM-173EE)		
	D5	AFT ON (always)		AFT OFF (after fine tuning)		MUST = LOW		
	D4	Existing sharpness level : TDA6108		Sharpness level up : TDA6107Q		MUST = HIGH		
	D3	No Auto Power On		Auto Power On		MUST = HIGH		
	D2	NTSC : 25 KHz (NTSC TABLE) PAL : 50 KHz (PAL TABLE)		NTSC : 25KHz(NTSC TABLE) PAL : 27KHz(NTSC TABLE)				
	D1	PAL / SECAM		SECAM - L		- France/Swiss (only) : HIGH		
	D0	MUST : LOW						

● P-STD Classification (CON./BRI./SHAR./COL)

STANDARD MODE	DYNAMIC MODE	MOVIE MODE	MILD MODE	CUSTOM MODE
90/50/50/50	100/50/75/50	90/50/75/50	60/50/50/50	90/50/50/50

- Function Required: 1. PICTURE OFF (after 15 minutes) during no signal. 2. AUDIO MUTE during no signal.
3. No BLUE SCREEN during no RF signal (Blue Screen during AV).
4. No TIMER. 5. No CHILD LOCK. 6. See "Detailed functions of CF".

4-2-4 C) NON-TTX MICOM (SZM-173ER) OPTION BYTE (FOR RUSSIA)

Destination		BYTE 0		BYTE 1	
Russia,CIS		49		58	
Australia		5D		18	
India (CB MONO MODEL)		5D		38	

BYTE	BIT	LOW(0)		HIGH(1)		Remark
B Y T E 0	D7					MUST = LOW
	D6	TV : NORMAL → ZOOM A/V : NORMAL → ZOOM		TV : NORMAL → ZOOM → 16:9 A/V : NORMAL → ZOOM		MUST = HIGH
	D5					MUST = LOW
	D4	CH Up/down functional in the A/V Mode (SCART Jack)		CH Up/down not functional in the A/V Model (RCA Jack)		
	D3	PAL-I Used		PAL-I Not Used		MUST = HIGH
	D 2	D2	D1	SOUND SYSTEM		COLOR SYSTEM
		0	0	"?" → B/G ↔ D/K : CK MODEL		AUTO : NO OSD
		0	1	I ONLY (NO OSD) : CI,CII MDL		
		D 1	1	0	B/G ONLY (NO OSD) : CB,CX MDL	
	1		1	NOT USED		
D0	TDA8374A		TDA8842		IC201 (ONE-CHIP) OPTION	

B Y T E 1	D7					MUST = LOW
	D6	English		English/Russian		
	D5	AFT ON (always)		AFT OFF (after fine tuning)		BASIC = LOW (India HIGH)
	D4	Existing sharpness level (when using the TDA6108 RGB AMP)		Sharpness level up (when using the TDA6107Q AMP)		MUST = HIGH
	D3	No Auto Power On		Auto Power On		BASIC = HIGH
	D2	NTSC: 25 KHz (NTSC TABLE) PAL : 50 KHz (PAL TABLE)		NTSC : 25 KHz (NTSC TABLE) PAL : 27 KHz (NTSC TABLE)		
	D1	NOT USED (MUST = LOW)				
	D0					

● P-STD Classification (CON/BRI/SHAR/COL)

STANDARD MODE	DYNAMIC MODE	MOVIE MODE	MILD MODE	CUSTOM MODE
90/50/50/50	100/50/75/50	90/50/75/50	60/50/50/50	90/50/50/50

- Function Required :
1. PICTURE OFF (after 15 minutes) during no signal
 2. AUDIO MUTE during no signal
 3. BLUE SCREEN available
 4. TIMER available
 5. No CHILD LOCK

4-2-4 (D) NON-TTX MICOM (SZM-173AR/EA) OPTION BYTE (FOR MIDDLE EAST/AFRICA)

		Destination		BYTE 0	BYTE 1
MP OPTION BYTE		Middle East (EA or AR)		7F	58
		Africa (EA)		67	D8
		GAME (Middle East)		7F	5A

BYTE	BIT	LOW (0)		HIGH (1)		Remark
B Y T E 0	D7					MUST = LOW
	D6	TV : NORMAL → ZOOM A/V : NORMAL → ZOOM		TV : NORMAL → ZOOM → 16:9 A/V : NORMAL → ZOOM		MUST = HIGH
	D5	NOT USED		CHILD LOCK ON		MUST = HIGH
	D4	CH Up/down functional in the A/V Mode (SCART Jack)		CH Up/down not functional in the A/V Model (RCA Jack)		Middle East : HIGH Africa : LOW
	D3	Sound-I System Used		Sound-I System Not Used		
	D 2	D2	D1	COLOR SYSTEM		SOUND SYSTEM
		0	0	● CK : AUTO (NO OSD)		"?" → B/G → D/K
		0	1	● CW : -. RF : AUTO → PAL → SECAM → NT4.43 -. A/V : AUTO → PAL → SECAM → NT4.43 → NT3.58		"?" → B/G → D/K → I
	D 1	1	0	● CB : -. RF : PAL ONLY - A/V : AUTO → PAL → NT4.43 → NT3.58		B/G ONLY (NO OSD)
		1	1	● CS : -. RF : AUTO → PAL → SECAM → NT4.43 → NT3.58 -. A/V : AUTO → PAL → SECAM → NT4.43 → NT3.58		"?" → B/G → D/K → I → NT- M →
	D0	TDA8374A		TDA8842	IC201 (ONE-CHIP) OPTION	

B Y T E 1	D7	D7	D6	LANGUAGE	Remark
		0	0	-	NOT USED
		0	1	ENG / ARAB	Middle East
		1	0	-	NOT USED
	D6	1	1	ENG / ARAB / FRENCH	EA VERSION (Africa ONLY)
	D5	AFT ON (always)		AFT OFF after fine tuning	MUST = LOW
	D4	Existing sharpness level (when using the TDA6108 RGB AMP)		Sharpness level up (when using the TDA6107Q RGB AMP)	MUST = HIGH
	D3	No Auto Power On		Auto Power On	MUST = HIGH
	D2	NTSC : 25 KHz (NTSC TABLE) PAL : 50 KHz (PAL TABLE)		NTSC : 25 KHz (NTSC TABLE) PAL : 27 KHz (NTSC TABLE)	
	D1	Others		GAME	
	D0	MUST = LOW			

- Function Required :
1. PICTURE OFF (after 15 minutes) during no signal
 2. AUDIO MUTE during no signal.
 3. BLUE SCREEN ON/OFF
 4. TIMER (CLOCK ON/OFF)
 5. CHILD LOCK ON (always)

4-2-4 (E) NON-TTX MICOM (SZM-173EV/ET) OPTION BYTE (FOR ASIA)

	DESTINATION	LINE-STREEO		MONO(TV-OUT)		MONO(MONO-OUT)	
		BYTE 0	BYTE 1	BYTE 0	BYTE 1	BYTE 0	BYTE 1
OPTION - BYTE	Vietnam / Malaysia	DF	D8	5F	58	5F	D8
	Indonesia (CB MODEL CLOCK ON)	DD	DA	5D	5A	5D	DA
	Thailand (CB MODEL)	—		5D	58	5D	D8
	India (CB MODEL AFT OFF)	DD	B8	—	—	—	—
	India (CS MODEL AFT OFF)	DF	B8	5F	38	5F	B8

BYTE	BIT	LOW (0)		HIGH (1)		Remark	
B Y T E 0	D7	LINE STEREO OFF		LINE STEREO ON		SZM-173EV (only)	
	D6	TV : NORMAL → ZOOM A/V : NORMAL → ZOOM		TV : NORMAL → ZOOM → 16:9 A/V : NORMAL → ZOOM		MUST = HIGH	
	D5					MUST = LOW	
	D4	CH Up/down functional in the A/V Mode (SCART Jack)		CH Up/down not functional in the A/V Mode (RCA Jack)		BASIC = HIGH	
	D3	Sound-I System Used		Sound-I System Not Used			
	D2	D2	D1	COLOR SYSTEM		SOUND SYSTEM	Destination
		0	0	● CK : AUTO (NO OSD)		"?" → B/G → D/K	
		0	1	● CW : - RF : AUTO → PAL → SECAM → NT4.43 - A/V : AUTO → PAL → SECAM → NT4.43 → NT3.58		"?" → B/G → D/K → I	
	D1	1	0	● CB : - RF : PAL ONLY - A/V : AUTO → PAL → NT4.43 → NT3.58		B/G ONLY (NO OSD)	Indonesia/Thailand/ India
		1	1	● CS : - RF : AUTO → PAL → SECAM → NT4.43 → NT3.58 - A/V : AUTO → PAL → SECAM → NT4.43 → NT3.58		"?" → B/G → D/K → I NT- M →	Vietnam Malaysia
	D0	TDA8374A		TDA8842		IC201 (ONE-CHIP) OPTION	
B Y T E 1	D7	TV OUT		MONITOR OUT			
	D6	English ONLY		English/Vietnamese/Indonesian/Malay		SZM-173EV	
				English/Thai		SZM-173ET	
	D5	AFT ON (always)		AFT OFF (after fine tuning)			
	D4	Existing sharpness level (when using the TDA6108 RGB AMP)		Sharpness level up (when using the TDA6107Q RGB AMP)		MUST = HIGH	
	D3	No Auto Power On		Auto Power On		BASIC = HIGH	
	D2	NTSC : 25KHz (NTSC TABLE) PAL : 50KHz (PAL TABLE)		NTSC : 25KHz (NTSC TABLE) PAL : 27KHz (PAL TABLE)		MUST = LOW	
	D1	CLOCK DISPLAY OFF		CLOCK DISPLAY ON		Indonesia ONLY : HIGH	
	D0			MUST = LOW			

- Function Required : 1. PICTURE OFF (after 15 minutes) during no signal. 2. AUDIO MUTE during no signal.
3. BLUE SCREEN ON/OFF. 4. TIMER (CLOCK ON/OFF). 5. No CHILD LOCK

SZM -173ET (16K) : Z90203 → WITHOUT LINE STEREO

SZM -173EV (24K) : Z90234 → WITH LINE STEREO

4-2-4 (F) TTX MICOM (SZM-175EA/EP) OPTION BYTE (FOR MIDDLE EAST ASIA)

MP OPTION BYTE	Destination		Application MICOM		BYTE0	BYTE1
	Iran (Persian TTX)		SPM-175EP		1F	1B
	Middle East (except Iran)		SPM-175EA		1F	1B
	Africa				07	1B
	Singapore				17	1B

BYTE	BIT	LOW (0)		HIGH (1)		Application MICOM		
B Y T E 0	D7	NOT USED				ALL = LOW		
	D6	TV : NORMAL → ZOOM → 16:9 A/V : NORMAL → ZOOM		TV : NORMAL → ZOOM → 16:9 A/V : NORMAL → ZOOM → 16:9		MUST = LOW		
	D5	NOT USED				ALL = LOW		
	D4	CH Up/down functional in the A/V Mode (SCART Jack)		CH Up/down not functional in the A/V Mode (RCA Jack)		- Africa : SCART - Others : RCA		
	D3	Sound-I System Used		Sound-I System Not Used				
	D2	D2	D1	COLOR SYSTEM		SOUND SYSTEM		Remark
		0	0	● CK : AUTO (NO OSD)		"?" → B/G → D/K		No sound system in the A/V MODE
		0	1	● CW : ■ RF : AUTO → PAL → SECAM → NT4.43 ■ A/V : AUTO → PAL → SECAM → NT4.43 → NT3.58		"?" → B/G → D/K → I →		
	D1	1	0	● CB : ■ RF : PAL ONLY (NO OSD) ■ A/V : AUTO → PAL → NT4.43 → NT3.58		B/G ONLY (NO OSD)		
		1	1	● CS : ■ RF : AUTO → PAL → SECAM → NT4.43 → NT3.58 ■ A/V : AUTO → PAL → SECAM → NT4.43 → NT3.58		"?" → B/G → D/K → I → NT → M →		
	D0	TDA8374A		TDA 8842				

B Y T E 1	D7	NOT USED				ALL (FIX = LOW)		
	D6							
	D5							
	D4	Existing sharpness level (when using the TDA6108 RGB AMP)		Sharpness level up (when using the TDA6107Q RGB AMP)		ALL (BASIC = HIGH) → TEST Unnecessary		
	D3	No Auto Power On		Auto Power On		ALL (BASIC = HIGH)		
	D2	NTSC : 25 KHz (NTSC TABLE) PAL : 50 KHz (PAL TABLE)		NTSC : 25 KHz (NTSC TABLE) PAL : 27 KHz (NTSC TABLE)				
	D1	D1 D0		00	01	10	11	MUST = HIGH
	D0			B/G	D/K	I	?	

● OSD language by micom

1. Persian (for Iran) : SPM-175EP : English/Persian (Iranian)
2. Arab (Middle East, Africa) : SPM-175EA : English/French/Arabian

● Function Required : 1. PICTURE OFF (after 15 minutes) during no signal

2. AUDIO MUTE (during no signal)
3. No BLUE SCREEN
4. No TIMER
5. No CHILD LOCK

4-2-4 (G) TTX MICOM (SPM-175EE/ER/EG/EU) OPTION BYTE (FOR EUROPE)

		Destination		Application MICOM		BYTE 0		BYTE 1		LANGUAGE	
MP OPTION BYTE		United Kingdom (CI)		SPM-175EE		83		18		See BYTE 1 D5	
		Other Western Europe (CB)				05		18			
		Eastern Europe (CK)				01		38			
		Ireland (CII)				03		18			
		France/Swiss		SPM-175EU		05		58		English/Yugo/Greek	
		Yugo/Greece		SPM-175EG		05		18			
		Russia/Bulgaria		SPM-175ER		01		19		English/Russian/Bulgarian	
BYTE	BIT	LOW(0)				HIGH(1)				Remark	
B Y T E 0	D7	3 BAND				UHF DNLy (UK only)					
	D6	TV : NORMAL → ZOOM → 16:9 A/V : NORMAL → ZOOM				TV : NORMAL → ZOOM → 16:9 A/V : NORMAL → ZOOM → 16:9					
	D5	MUST = LOW				<POLAND OPTION> R 913 : 680Ω added. J901 : Delete					
	D4	CH Up/Down functional in the A/V Mode (SCART Jack)				CH Up/Down not functional in the A/V Model (RCA Jack)				MUST = LOW	
	D3	P-STD NORMAL				P-STD MAX				MUST = LOW	
	D2	D2	D1	SOUND SYSTEM			COLOR SYSTEM		Remark		
		0	0	"?" → B/G ↔ D/K : CK MODEL			AUTO (NO OSD)		No SOUND SYSTEM in the A/V Mode		
		0	1	I ONLY (NO OSD) : CI,CII MODEL							
		D1	1	0	B/G ONLY (NO OSD): CB,CX MODEL						
	1		1	NOT USED							
D0	TDA8374A				TDA8842						
B Y T E 1	D7	NOT USED								FIX = LOW	
	D6	PAL/SECAM				SECAM - L				HIGH (CF only)	
	D5	English/German/French/Dutch/ Italian/Spanish/Swedish				English/Croatian/Romanian/ Hungarian/Polish/Czech				This bit is only applied to SPM-175EE	
	D4	Existing sharpness level (when using the TDA6108 RGB AMP)				Sharpness level up (when using the TDA6107Q AMP)				ALL BASIC = HIGH → TEST Unnecessary	
	D3	No Auto Power On				Auto Power On				ALL BASIC = HIGH	
	D2	NTSC : 25KHz (NTSC TABLE) PAL : 50KHz (PAL TABLE)				NTSC : 25KHz (NTSC TABLE) PAL : 27KHz (NTSC TABLE)				ALL (RF VOL. CURVE) BASIC = LOW	
	D1	MUST = LOW									
	D0	B/G				D/K				175ER is only applied (Others = LOW)	

● P-STD Classification (CON/BRI/SHRP/COL)

D3 BIT	STANDARD MODE	DYNAMIC MODE	MOVIE MODE	MILD MODE	CUSTOM MODE
0	90/50/50/50	100/50/50/50	75/55/50/50	60/50/50/50	90/55/25/50

- Function Required : 1. PICTURE OFF (after 15 minutes) during no signal. 2. AUDIO MUTE (during no signal).
3. No BLUE SCREEN. 4. No TIMER (CLOCK /OFF). 5. No CHILD LOCK

4-2-5 RESET

The Reset Mode is used during factory inspection.
Function Reset:

1. Channels	Add/Erase
2. Sort	Non
3. System	Auto
4. Timer	off
5. Blue Screen	off
6. Child Lock	off
7. Picture	standard
8. Volume	10
9. CH. Skip	Erased

4-3 Other Adjustments

4-3-1 General

1. Usually, a color TV needs only slight touch-up adjustment upon installation. Check the basic characteristics such as height, horizontal and vertical sync and focus.
2. The picture should have good black and white details. There should be no objectionable color shading; if color shading is present, perform the purity and convergence adjustments described below.
3. Use the specified test equipment or its equivalent.
4. Correct impedance matching is essential.
5. Avoid overload. Excessive signal from a sweep generator might overload the front-end of the TV. When inserting signal markers, do not allow the marker generator to distort test results.
6. Connect the TV only to an AC power source with voltage and frequency as specified on the backcover nameplate.
7. Do not attempt to connect or disconnect any wires while the TV is turned on. Make sure that the power cord is disconnected before replacing any parts.
8. To protect against shock hazard, use an isolation transformer.

4-3-2 Automatic Degaussing

A degaussing coil is mounted around the picture tube, so that external degaussing after moving the TV should be unnecessary. But the receiver must be properly degaussed upon installation.

The degaussing coil operates for about 1 second after the power is switched ON. If the set has been moved or turned in a different direction, disconnect its AC power for at least 30 minutes.

If the chassis or parts of the cabinet become magnetized, poor color purity will result. If this happens, use an external degaussing coil. Slowly move the degaussing coil around the faceplate of the picture tube and the sides and front of the receiver. Slowly withdraw the coil to a distance of about 6 feet before removing power.

4-3-3 High Voltage Check

CAUTION: There is no high voltage adjustment on this chassis. The B+ power supply must be set to +125 volts (Full color bar input and normal picture level).

1. Connect a digital voltmeter to the second anode of the picture tube.
2. Turn on the TV. Set the Brightness and Contrast controls to minimum (zero beam current).
3. The high voltage should not exceed 27.5KV.
4. Adjust the Brightness and contrast controls to both extremes. Ensure that the high voltage does not exceed 27.5KV under any conditions.

4-3-4 FOCUS Adjustment

1. Input a black and white signal.
2. Adjust the tuning control for the clearest picture.
3. Adjust the FOCUS control for well defined scanning lines in the center area of the screen.

4-3-5 Cathode Voltage Adjustment (Screen Adjustment)

1. Connect CRT socket pin GK to an oscilloscope probe.
2. Input a gray scale pattern. (Use a pattern generator, PM5518)
3. Use the P mode key (on the remote control) for the STANDARD picture.
4. Adjust the Screen VR (on the FBT) so that the voltage on the oscilloscope becomes $130 \pm 2.5V$ (See Fig. 4-1).

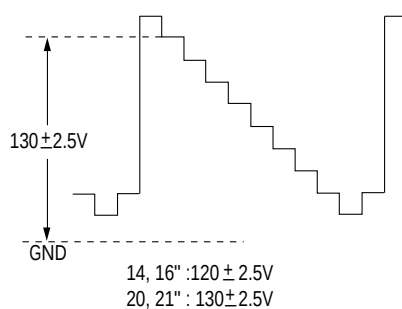


Fig. 4-1

4-3-6 Purity Adjustment

1. Warm up the receiver for at least 20 minutes.
2. Plug in the CRT deflection yoke and tighten the clamp screw.
3. Plug the convergence yoke into the CRT and set in as shown in Fig. 4-2.
4. Input a black and white signal.
5. Fully demagnetize the receiver by applying an external degaussing coil.
6. Turn the CONTRAST and BRIGHTNESS controls to maximum.
7. Loosen the clamp screw holding the yoke. Slide the yoke backward or forward to provide vertical green belt. (Fig. 4-3).
8. Tighten the convergence yoke.
9. Slowly move the deflection yoke forward, and adjust for the best overall green screen.
10. Temporarily tighten the deflection yoke.
11. Produce blue and red rasters by adjusting the low-light controls. Check for good purity in each field.
12. Tighten the deflection yoke.

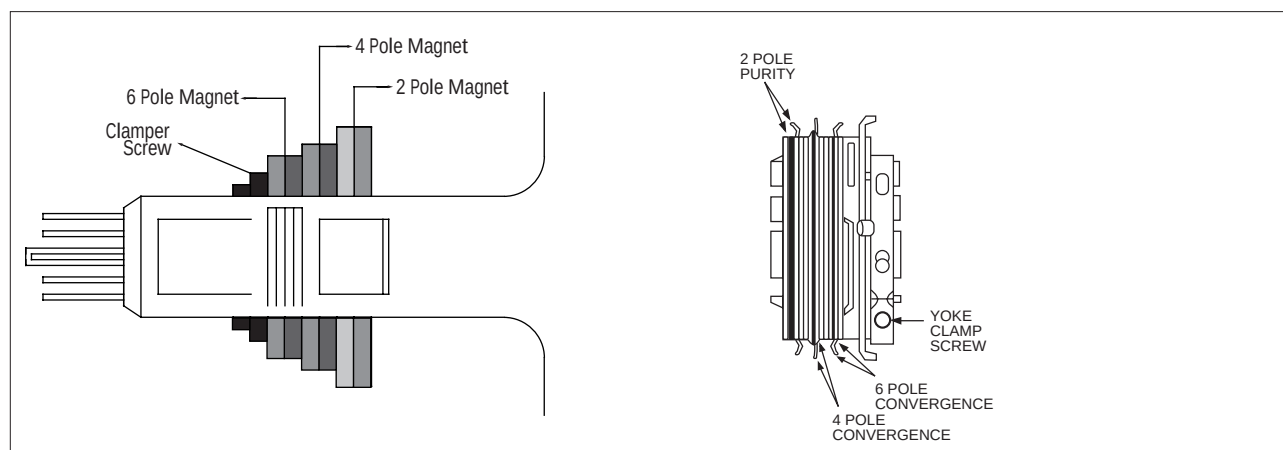


Fig. 4-2 Convergence Magnet Assembly

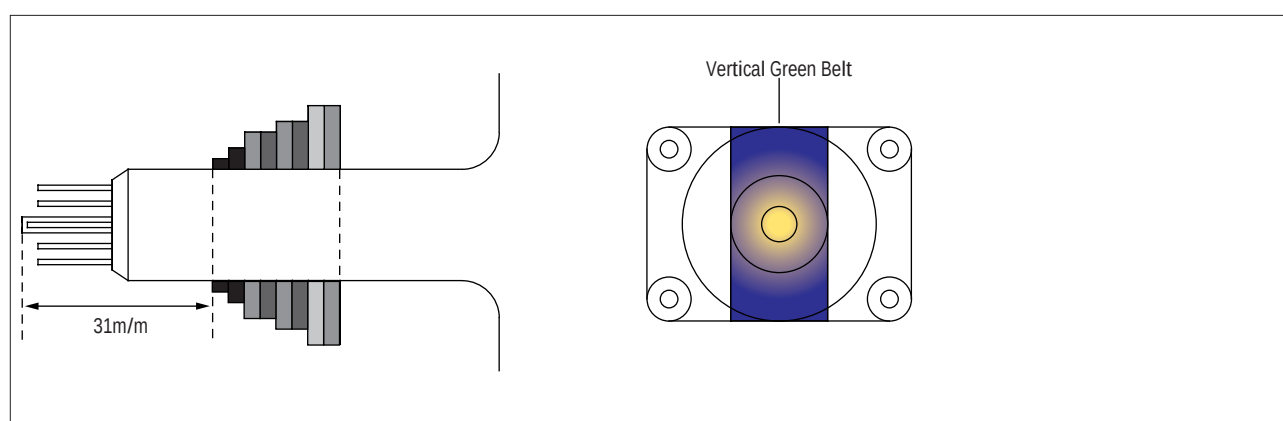


Fig. 4-3 Center Convergence Adjustment

4-3-7 White Balance Adjustment

(a) Set up

1. Warm up the TV for at least 30 minutes in the Aging Mode (OSD White). This mode is displayed by entering the following sequence:

SLEEP → FACTORY → FACTORY

2. Input a Toshiba pattern.

(b) Low-Light Adjustment

1. Set SBT to 1.3 ± 0.2 fL in the Factory Service Mode with using CA100. See Fig. 4-4 ②.
2. Adjust RG,BG so that the levels are suitable to each local area.

(c) High-Light Adjustment

1. Set SCT to 55 FL (20". 21"), 65 FL(14".16") in the Factory Service Mode with using CA100. See Fig. 4-4 ①.

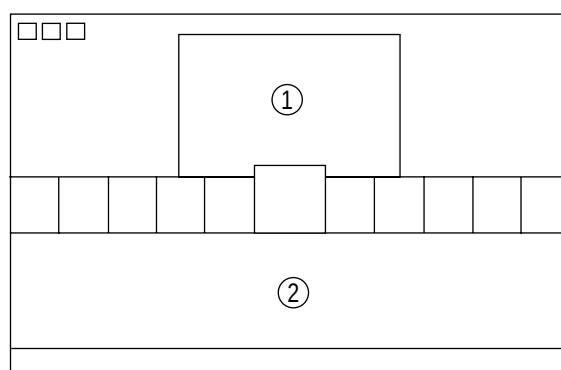


Fig. 4-4

4-3-8 Center Convergence Adjustment

1. Warm up the receiver for at least 20 minutes.
2. Adjust the two tabs of the 4 pole magnets to change the angle between them. Superimpose the red and blue vertical lines in the center area of the screen.
3. Adjust the Brightness and Contrast controls for a well defined picture.
4. Adjust the two-tab pairs of the 4 pole magnets, and change the angle between them. Superimpose the red and the blue vertical lines in the center area of the screen.
5. Turn the both tabs at the same time, keeping the angle constant, and superimpose the red and blue horizontal line in the center of the screen.
6. Adjust the two-tab pairs of the 6-pole magnets to superimpose the red and blue line onto the green. (Changing the angle affects the vertical lines, and rotating both magnets affects the horizontal lines.)
7. Repeat adjustments 2~6, if necessary.
8. Since the 4-pole magnets and 6-pole magnets interact, the dot movement is complex (Fig. 4-5).

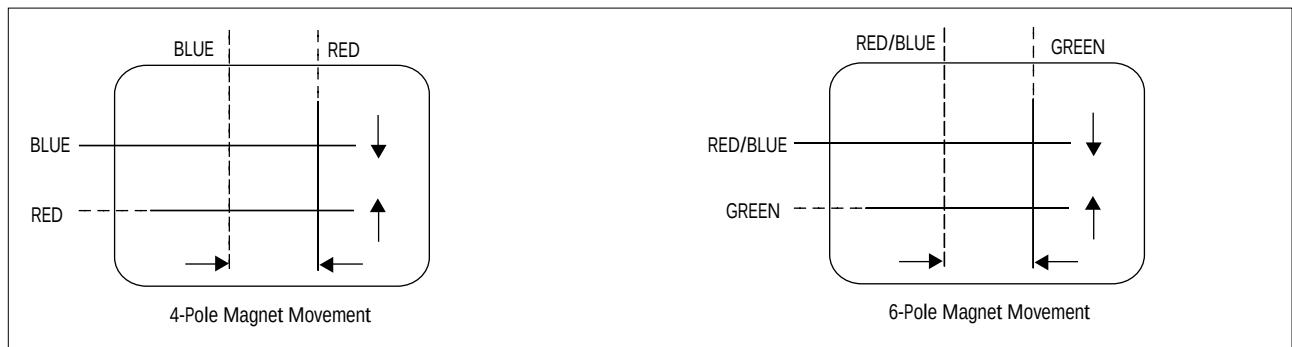


Fig. 4-5 Center Convergence Adjustment

4-3-9 VCO Adjustment

Set the vco data to 80 (Factory Mode).

NOTE : For SZM-173EW and SPM-175E (Western Europe remote control), set the VCO data to 1.

4-3-10 RF AGC Adjustment

Set the AGC data to 14 (Factory Mode).

4-3-11 Sub-Color Adjustment

Set SCR data to 10 (Factory Mode).

4-3-12 Geometry Adjustment

SC → PVA → PVS → PSL → PHS

1. Input a lion head pattern (in the PAL channel).
2. Set the SC (S-Correction) as follows : 12 (21"), 10 (20"), 0 (14", 16") and PVA 40 so that the lion head circle becomes oval.
3. Adjust with PVS (Vertical shift) so that the top margin of the picture is 4.

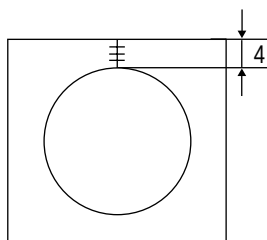


Fig. 4-7

4. Adjust with PSL (Vertical-Slope) so that the bottom margin of the picture is 4.

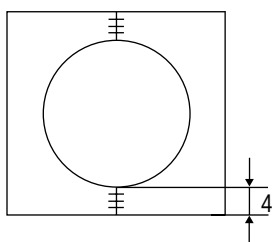


Fig. 4-8

5. Adjust with PHS (Horizontal Shift) so that the lion-head pattern and CRT centers are aligned.

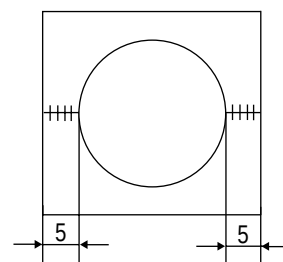


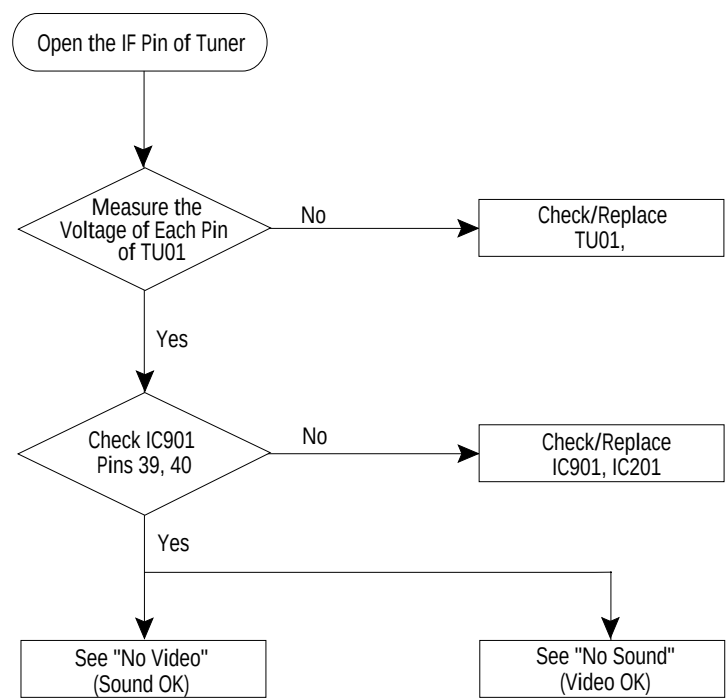
Fig. 4-9

6. Adjust PHS (using the width coil) so that the left and right margins of the picture are 5.

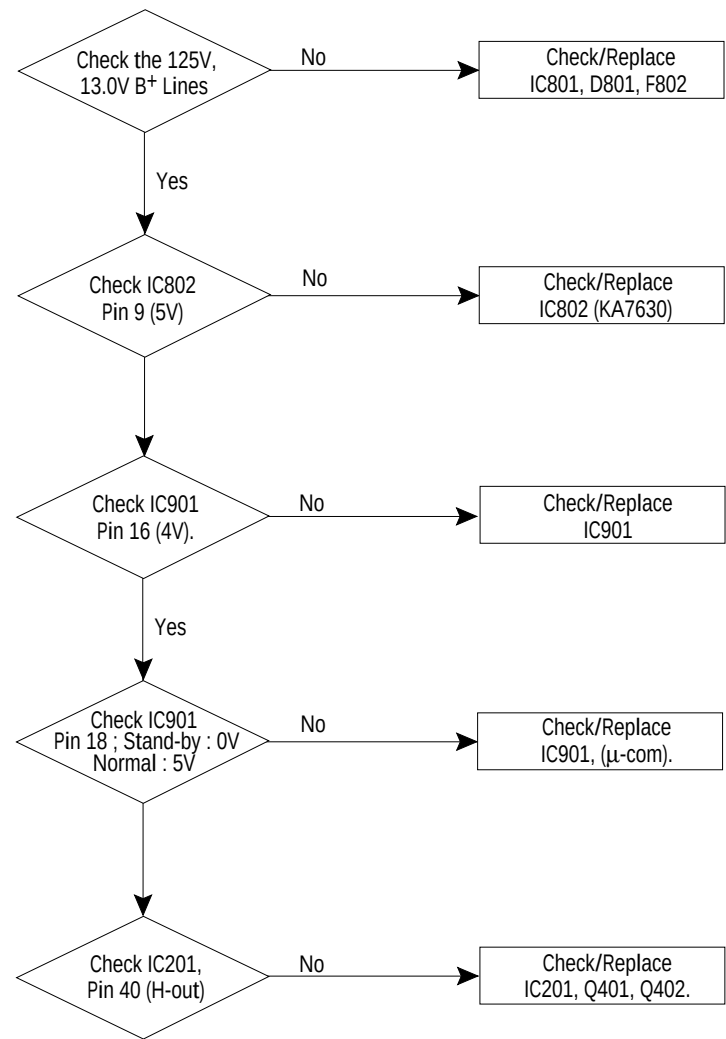
MEMO

5. Troubleshooting

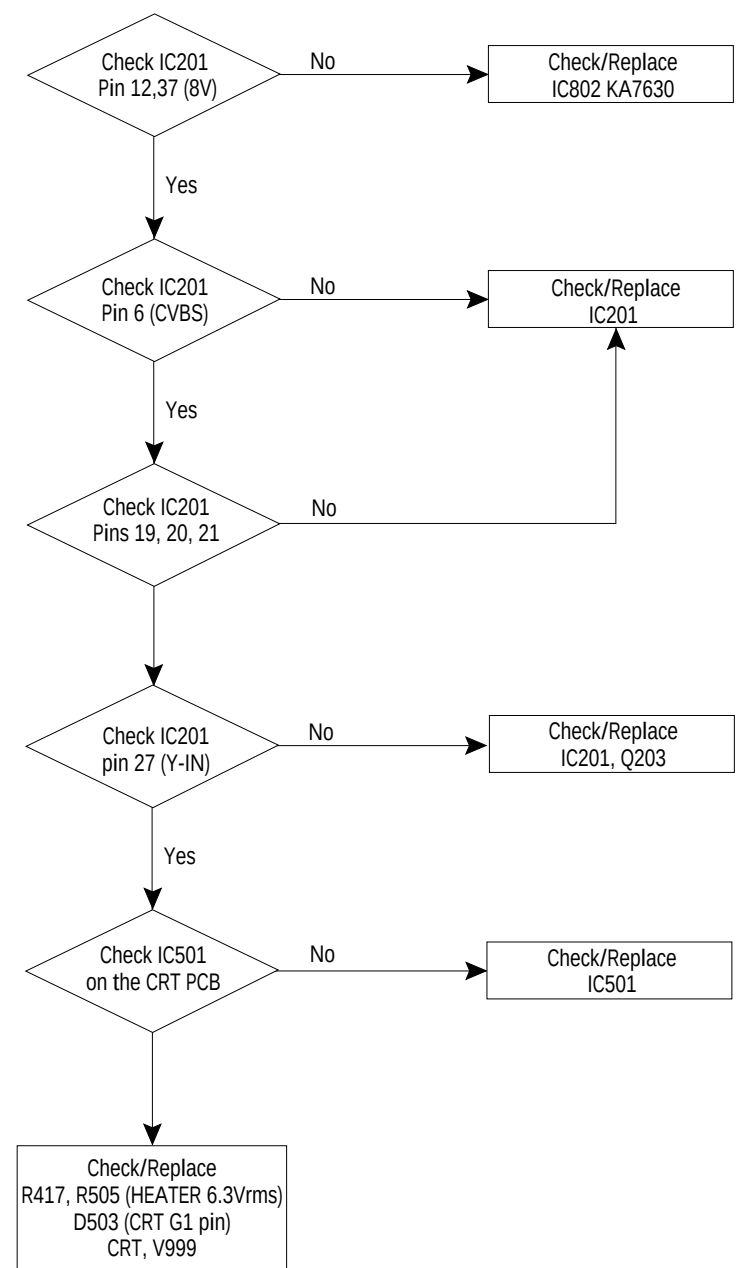
5-1 No Video (Raster On, No Sound)



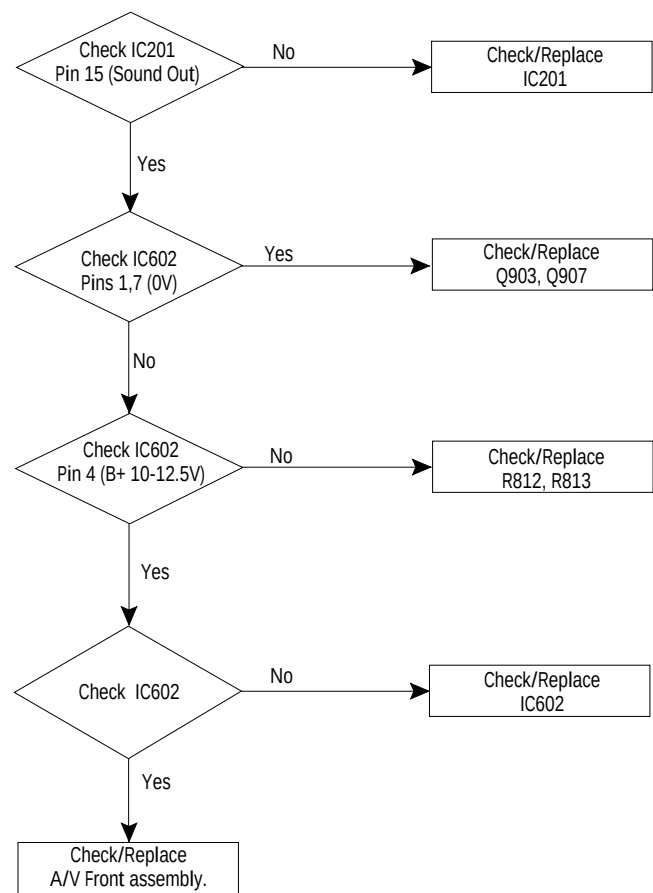
5-2 No Power



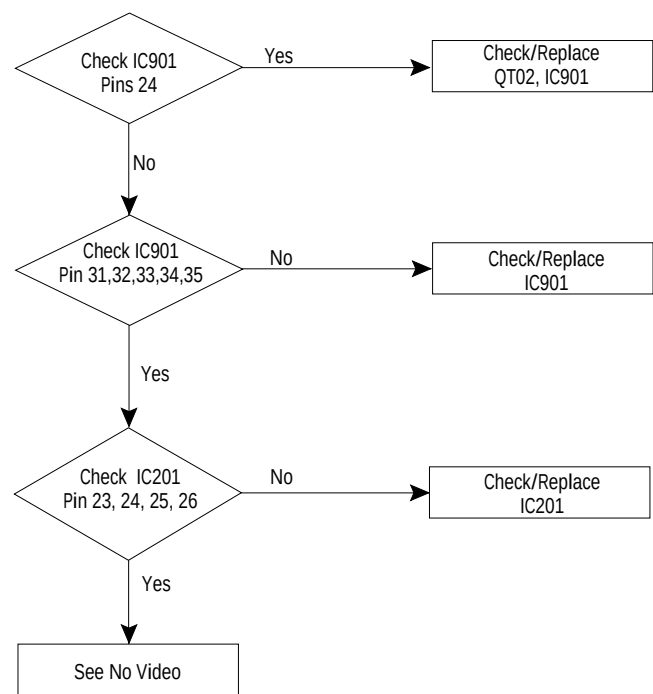
5-3 No Video (Sound OK)



5-4 No Sound (Video OK)

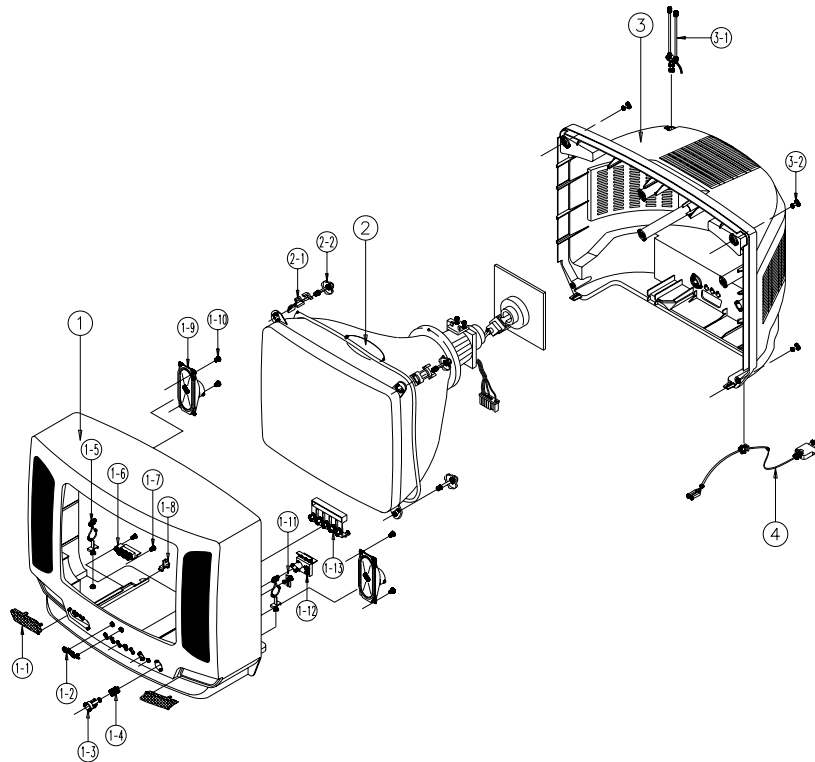


5-5 No TTX



6. Exploded View & Parts List

6-1 CK331EVR5S/NWT



No	Code No	Description	Specification	Q'ty	Remark
1	AA91-10333F	ASSY-CABINET,FRONT	DP,CK331EVR,BK708P MLN,HB,BLK	1	
	AA64-30981T	CABINET-FRONT	-,CK331EVR,BK708P H,HIPS,HB,BL	1	
1-1	AA63-50306A	GRILLE-WOOFER,R	-,331E,PA110 3R,SECC,T0.5,-,-	1	
	AA63-50311A	GRILLE-WOOFER,L	-,331E,PA110 3R,SECC,T0.5,-,-	1	
1-2	AA64-70009F	BADGE-BRAND	AL,SS R800 22,SILVER,L40,-,-,-	1	
1-3	AA64-10638B	KNOB-POWER	-,331E,-,ABS,HB,BLK	1	
1-4	AA61-60005S	SPRING-CS	-,SUS304,0.6,OD10,H12.5,N4,-,-	1	
1-5	AA65-30105A	CLAMP-WIRE	NYLON 66,V2,NTR,15MM,ALL MODEL	1	
1-6	AA95-90028N	ASSY-PCB,A/V FRONT	DP,39,85,66,,SCT13B,AA41-10903	1	
1-7	AA60-10002A	SCREW-TAPPING	RH,+,M4,L12,ZPC(YEL),-,OD14	2	
1-8	AA61-40113A	STOPPER-PCB	501H,HIPS,NTR,HB,-,-	1	
1-9	3001-001034	SPEAKER	6W,8ohm,90dB,140Hz	2	
1-10	6002-000514	SCREW-TAPPING	RH,+,2,M4,L15,ZPC(BLK),SWRCH18	4	
1-11	AA64-40408A	INDICATOR-LED	-,501E,-,ACRYL,HB,CLR,-	1	
1-12	AA64-40407A	WINDOW-REMOCON	-,501E,-,PC,-,-,VIOLET	1	
1-13	AA64-10637A	KNOB-CONTROL	-,501E,-,ABS,HB,BLK	1	
2	AA03-10001D	CRT-COLOR	-,A34KQV42X,+380MG,14,90DEG,5	1	
2-1	AA65-30106A	CLAMP-D,COIL	NYLON 66,V2,NTR,-,14 INCH,-	2	
2-2	AA60-10050R	SCREW-ASSY	WC,HH,+,M5,L31.5,SWRCH18A,ZPC(	4	
3	AA64-30983D	CABINET-BACK	-,CK331E,-,HIPS,V2,BLK,-,-	1	
3-1	AA42-10001V	ANT-ROD	-,3S,620mm,BRN,UL/CSA	1	
3-2	6002-000514	SCREW-TAPPING	RH,+,2,M4,L15,ZPC(BLK),SWRCH18	4	
4	AA39-10001G	POWER-CORD	-,KKP-419C,KLCE-2F,2.286m,HOUS	1	